

A Note from the Editor



REBECCA JONES

The *Upland Gazette* has undergone many transitions since its inception in 1996 going from a stand-alone publication in the early years to one included in the *Spring* and *Fall Guides of Wildlife* in North Carolina magazine in recent years. Our content has even changed over the years as we have added diverse wildlife topics to a publication once targeted mainly at bobwhite quail and other small game.

This year, we will experience another change. Due to budgetary concerns, *Wildlife in North Carolina* is discontinuing the *Spring* and *Fall Guides* which means *The Upland Gazette* will once again become a standalone publication. As of the writing of this Editor's note, the complete future of *The Upland Gazette* is a little unclear. My expectation is that this Fall 2021 issue will be published on the Wildlife Commission's website (ncwildlife.org/UplandGazette) and made available to the tens of thousands of regular readers as well as anyone else who finds the online links. There is some discussion about printing copies like we did in the old days, but final decisions about that have not been made when this issue went to press.

There will be another change coming to *The Upland Gazette*. After almost three decades of work helping conserve and manage North Carolina's wildlife resources, I plan to retire effective August 1, 2021. I began my work with this Agency as a graduate student studying black bears in eastern North Carolina in 1992, and I spent the last few decades working on everything from black bears, otters, songbirds, and quail to Federal Farm Bill programs. I edited *The Upland Gazette* for 14 years.

I am proud to have worked with the first-class professionals of the Wildlife Resources Commission and will miss working with this Agency and its fine employees. I'll also miss our constituents who care so much about North Carolina's wildlife and natural resources. I learned many things working with our staff, hunters, and general citizens, and I will always cherish the friendships I made and work we accomplished together.

I am sure the Wildlife Resources Commission will find a qualified and passionate person to edit and manage *The Upland Gazette*. As for me, my family and I have an opportunity to pursue a dream and move to Wyoming where I will begin a new chapter in my career with a National Organization. I have loved the West since I was a child, and I have traveled and hunted extensively there for over 30 years. This new role will put me closer to pronghorn antelope, ring-necked pheasants, multiple species of upland game birds, and a few other fascinations that cause me to drive many thousands of miles each Fall. I hope my old bird dog can spend more time hunting and less time riding.

Here is wishing North Carolina's citizens and wildlife resources nothing but the best over the coming years. Thanks for giving me the opportunity to be part of your story over the last few decades.

Mark D. Jones

STATEWIDE WILDLIFE HABITAT COORDINATOR

THE Upland GAZETTE

WILDLIFE CONSERVATION AND HABITAT MANAGEMENT



The author with his first bobwhite quail. It was taken after many miles of walking and effort in the cold of a Kansas January.

MARK JONES/NCWRC

When a Gun Guy Falls in Love with Hunting

By Jordan Stein

Growing up in central North Carolina, I was raised with firearms. From an early age, my dad taught me gun safety and a healthy respect that is due to firearms.

A love of guns is ingrained into me. In high school and college, I was known as that "gun guy." I could tell you everything you wanted to know about the 9mm versus .45 ACP debate, John Moses Browning, or Mossberg 500 versus Remington 870 shotguns. To me, firearms represent history, heritage, and freedom.

Even though I was blessed with a North Carolina lifetime hunting license when I was born, I rarely hunted growing up. I always respected and appreciated hunters, but hunting was something someone else did, not me. My interest was in pulling triggers, not taking game.

However, that changed when I moved back to North Carolina in March 2020 at age 25 after working a few years in Virginia. I was blessed to meet a couple of sportsmen who got me "hooked" on hunting and have given me incredible opportunities to enjoy the outdoors.

The first step I completed before going afield was taking a hunter education course in the summer of 2020. Because of COVID-19 restrictions, I elected to use an online course. I found the course to be very informative, and I even learned a few gun safety tips that aren't necessarily common on a shooting range. It's great to know that courses like these are a factor in reducing hunting accidents and give sportsmen the knowledge to hunt legally and ethically.

Fast Flying Doves

The first hunting opportunity I was presented with was dove hunting, and it came about in a hurry. One evening in September, I got a call asking if I wanted to hunt doves the next morning in Southwest Virginia. I immediately said yes. This was the first time I hunted ANYTHING in over a decade! And then, I realized I was not properly licensed to hunt in the Commonwealth. Thankfully, there was still enough time for a quick trip to a store in Virginia to get all the documentation needed to hunt in the Old Dominion.

Back at home, I started my preparations for the hunt. I laid out my clothes, shells, stool, and shotgun for the morning. I also set multiple alarms on my phone to ensure I would wake up in time. Much to my wife's chagrin, the next morning I left well before sunrise to travel to a field somewhere in Southwest Virginia.

Dove hunting was a completely new experience for me. Other than hand thrown clays, I had limited experience shooting moving targets with a shotgun—especially unpredictable, fast flying birds. Additionally, I was fortunate to hunt with my friend and his well-trained German Wirehaired Pointer who loved to retrieve birds. Watching the dog almost instantly retrieve a downed dove was a completely new experience for me.

Thankfully, the morning's hunt saw a lot of doves flying overhead. However, the first few groups of doves seemed to get away from me, and the pile of empty shells at my feet was a little higher than I would like to admit. However, I kept shooting, and finally downed a dove—and the dog brought it back in a flash. What an incredible feeling!

I was fortunate enough to hunt doves a few more times and kill more doves that season. Dove hunting remains one of my favorite types of hunting because of its relative simplicity, the tasty meat, and lots of shooting!

America's Favorite the White-tailed Deer

My next opportunity was to hunt white-tailed deer. This is the sort of hunting I was most familiar with growing up, but I was still a novice. And sadly, due to a work trip, I was out of the state for most

of the rifle season. I only had a few days to hunt, and I decided to take the first deer I saw.

Again, I did my best to not wake the wife when heading for my first deer hunt. A local landowner friend set me up in a raised stand in a corn field. Previously that season, some very nice trophy bucks were taken on this property. And while any hunter wants a big buck, I told myself I would be very pleased with any deer, even a doe.

I hunted all morning but saw very little game. Across the field, I saw a lone hen turkey but not much else. I stayed until mid-morning but then decided to take a break for lunch. Coming back in the midafternoon, I still had no success except for seeing a flock of turkeys, this time coming much closer to the stand.

The sun was almost setting, and I was pondering if I should pack up for the day. Then I looked across the field to my left. There was a buck! Instinct took over, and I raised my rifle and dropped the whitetail.

Taking that deer was perhaps one of the largest rushes of adrenaline I have ever felt. Simply put, it's something you must do to fully understand. And while that buck was simply a four pointer, the European mount proudly hangs in my office. My first deer is one I will never forget.

From this surge of adrenaline, one can easily understand why deer hunting is so popular. This coming season, while I will probably pass on a similar-sized buck, I look forward to putting more venison on the table.

A Western Experience

My next hunting opportunity was something very different than typical hunts in the Southeast. I had a chance to hunt pheasants and quail in Kansas in January 2021. This hunting trip was a brand-new experience—new location, new game, and new style of hunting. I had never traveled to the Great Plains, and I had no idea what it took to hunt upland game birds in that harsh environment in mid-winter. Fortunately, I was accompanying a person experienced in Western hunting – the same man who helped me learn to hunt doves in Southwest Virginia. This friend had made about 30 trips to the West and brought along a couple of fine German Wirehaired Pointers to make the trip even better.

This trip took the most preparation and had the steepest learning curve of any hunting I have done to date. Obviously, the topography of western Kansas can vary greatly from the Southeast, but the Sunflower State can have great habitat for upland birds.

Upland hunting was quite a challenge at first. Following an experienced bird dog while charging through thick, tall grass and keeping an eye out for a flushing bird requires a lot of coordination. But once one gets the hang of it, it's addicting.



The author harvested his first wild game animal, a fast flying mourning dove, in September 2020. This began his deep fascination with hunting.

MARK JONES/NCWRC



The author's first season hunting wild turkeys did not turn out to be successful. However, experiences gained with scouting, calling, and having gobblers slip away have intrigued Jordan to the point that he rarely goes more than a day without planning next year's hunt.

MARK JONES/NCWRC

On cold January days in western Kansas, I hunted for several days across many areas containing extensive habitats not found in North Carolina. I saw quail and pheasants but failed to connect on some early opportunities. My experienced hunting partner/guide harvested both species and encouraged me to keep walking and keep shooting. I was determined to take both a pheasant and a quail before returning to North Carolina.

Finally, I was hunting a particular section of land that was hilly and rough, especially for Kansas. On a previous day's hunt, I had seen both pheasant and quail on this plot, so I had my eyes open for anything. Suddenly a covey flushed right at my feet. Instinct took over again, and the shouldering and shooting of the shotgun happened in a flash. The dog quickly ran over—and when I saw feathers on the ground—I knew a bird was down. A few moments later, the dog retrieved the bird, and I felt another surge of adrenaline that rivaled harvesting a deer—another truly incredible feeling.

I'm very proud of my first quail, and I jokingly tell friends that I'm prouder of the quail than the deer because of the demanding challenges of upland hunting and miles of walking that went into taking that bird.

Chasing the Wily Wild Turkey

The final style of hunting I had an opportunity to try was turkey hunting. Growing up, I had heard of turkey hunting, but I was still largely unfamiliar with it. I was encouraged to take the Turkey Hunting Webinar hosted by the NCWRC, and I found it to be worth my time.

While I did not harvest a Tom this spring, I did get up close and personal to turkeys. One morning, after hearing a gobble, I was set up with my back against a tree near the edge of a field and woods. My experienced friend (the same who introduced me to doves and Kansas birds) called from behind me, and a mature Tom began walking the tree line towards me.

The author's first deer was taken from an elevated stand provided by a friendly landowner in Surry County. The thrill of the hunt and healthy meat provided by this buck are two of many reasons the author cannot wait for the next deer season to come.



DWIGHT SEAL

I had set up an “ambush” point that was within shotgun range and clear of any brush that would interfere with the shot. This gobbler just had to keep walking into my sights! But sadly, for an unknown reason, this turkey changed course and stayed out of shotgun range.

Seemingly as if it were a consolation prize, just as the gobbler left, a hen began to approach me, coming within a few yards of me. I remained perfectly still and quiet, trying not to move an inch or make a sound. It was amazing to watch this wild bird, which has such incredible vision, peck around while completely unaware I was there. I later humorously remarked I was at a “wild hen petting zoo” because she got so close to me. Hopefully, next Spring I can get a gobbler.

A Lifetime Passion Discovered

It would be remiss of me not to mention the fine eating these experiences have provided. From grilled doves and venison to baked quail and pheasants, my wife and I have discovered the health benefits and tastiness of the wild game I have harvested or been given. We look forward to hopefully sharing many additional wild game dinners over the coming years.

While I still thoroughly enjoy pulling triggers on a shooting range, I have found a new love of the outdoors through hunting. I constantly think about my next hunting adventure and scheme about ways to go hunting. I save annual leave from work. I read and watch videos about hunting and talk to as many experienced hunters as possible. I'm extremely grateful to the sportsmen who have given me the opportunities to enjoy the sport of hunting, and I encourage anyone, either a “gun guy” or not, to give hunting a try. You may just discover a life's passion which will forever change the way you view wildlife, nature, and the outdoors. 🍄

A Tumultuous Lifestyle: A Year in the Life of a Female Wild Turkey in North Carolina

By David Moscicki, Christopher Moorman, and Krishna Pacifici
Fisheries, Wildlife, and Conservation Biology Program, North Carolina State University
and Chris Kreh, North Carolina Wildlife Resources Commission

Most readers of the *Upland Gazette* have heard the gobble of a wild turkey echo through the woods or across a field, but that sound was a rare occurrence in the state several decades ago. Once nearly extirpated from most of North Carolina, wild turkey populations increased following intense restoration efforts, and turkey populations remain robust in most of North Carolina today. Now, thousands of North Carolina hunters don their hunting apparel every spring with the hopes of harvesting the highly prized male wild turkey (gobbler). However, the females of the species (hens) deserve an equal amount of respect for the critical role they played in helping restore populations and in sustaining the turkey numbers from one year to the next. We still have lots to learn about hen turkeys, and new Global Positioning System (GPS) transmitters have opened the door for us and other researchers to study them.

An Unprecedented Research Initiative

The North Carolina Wildlife Resources Commission, the National Wild Turkey Federation, Louisiana State University, and North Carolina State University have partnered to initiate one of the largest ever wild turkey research projects. It is certainly the largest ever in the state of North Carolina. We started this project to provide a comprehensive understanding of wild turkey ecology across the three regions of the state with an emphasis on female turkeys and their nesting and poult-rearing activities. Specifically, our objectives are to determine: 1) the timing of nesting, 2) the types of places hens prefer to nest, and 3) how likely the nests and the poults are to survive. We hope to annually capture and tag at least 50 female turkeys with GPS transmitters in each of the 3 regions so that we have a sufficient sample size to conduct robust analyses and address our objectives with a high degree of certainty.



On each of the private properties, the tried-and-true method of capturing turkeys with rocket nets was used.

Beginning in January 2020, we captured wild turkeys on private properties with the cooperation of many landowners. Since then, the research has extended across more than 22,000 acres of private land owned by more than 143 landowners. On each of the private properties, we used the tried-and-true method of capturing turkeys with rocket nets. Once turkeys were detected at trap sites, we organized our capture team with at least 1 individual hidden in a blind. That person deployed the rocket net over the turkeys and then the rest of the team rushed in to assist with safely placing the captured turkeys in a box where they stayed until it was their turn to be tagged. We put a uniquely numbered leg band on each hen turkey and attached a GPS transmitter using a backpack harness. The GPS units can record numerous daily locations over a period of 2 years. Having lots of locations for each hen turkey provides us a fine-scale snapshot into their daily activities. These

transmitters are an incredible tool for learning about the timing of wild turkey reproduction and when and where hens nest and raise their poults.

The Story of Hen #0228

In the last two years, we captured 482 wild turkeys including 320 hens. Each of these individuals had a story to tell us, and we recorded many aspects of these stories through use of radiotelemetry. In this article, we want to share the story of a year in the life of female wild turkey #0228. This hen was captured in Moore County on a 580-acre cattle farm along with six other hens on the morning of March 3, 2020. The trap site was in a small, gated yard alongside a cattle pasture nestled between a hardwood creek bottom and a cabin and was akin to the typical North Carolina Piedmont landscape. On the morning of capture, our research team woke at 3:30am to organize equipment and get set up in the blind. Thus began the



Each hen turkey received a uniquely number leg band and was fitted with a GPS transmitter using a backpack harness.

typical early morning on a capture day, hopefully to include the rush of adrenaline when turkeys appear in the field and the loud boom of the rockets that echo through the landscape when the net is shot over the heads of the unsuspecting turkeys. After we captured #0228 and her fellow hens, we examined her feathers and found that she was an adult (meaning this was at least her second winter). We attached band #0228 to her leg and fitted her with a GPS transmitter. We also collected several disease samples from her throat and cloaca. She was released in good condition in under 12 minutes of handling time.

The day after capture, #0228 moved about 1 mile from the trapping location and crossed a heavily trafficked road. Her group favored hanging out along a power line on most days during that March. By late March, the hen group had begun to break up, and on March 28, hen #0228 laid the first egg of what ultimately became a complete clutch

containing 13 eggs. On April 9, #0228 began incubating the eggs, which she continued for 28 more days. During the incubation period, #0228 never traveled more than 720 feet from the nest using an area of less than 2 acres. The few movements that #0228 did make were typically to defecate and locate water before returning to the nest. On May 6, #0228 managed to beat all odds and successfully hatched all 13 eggs. During the 2020 nesting season, only 18% of the 106 turkey nests we monitored hatched, so #0228 was one of the lucky ones.

We visited the nest after our radio-telemetry equipment was used to verify that #0228 and her brood of poults had left the immediate area. We located the nest only a few dozen feet off a dirt road in an area that had received a controlled burn only months previous. The site that #0228 selected for nesting was in a young stand of oak and other hardwood sprouts intermixed with brambles, Japanese honeysuckle, and herbaceous



On May 6, #0228 managed to beat all odds and successfully hatched all 13 eggs.

species such as dogfennel, all of which were top-killed by the fire and were resprouting from the roots or seed.

We continued to closely track #0228 to learn about the survival of the poults and the types of cover they used. Because the poults are flightless and cannot roost above ground for the first 2 weeks, they are especially vulnerable to predation during this period. Hence, high quality brooding cover, with lots of herbaceous vegetation, is one of the most critical components of wild turkey habitat. During the first check of #0228 and her brood on day 3 after hatching, #0228 had moved her brood 0.2 miles from the nest. She flushed from 30 feet away as the research team carefully approached, and she clucked and circled, a common behavior employed to lure potential predators away from poults. We counted only a single poult but there may have been others as the area was covered by dense ground cover. We left the area quickly to minimize any disturbance to #0228 and the poults. On the second

brood check 8 days after hatch, #0228 was still seen with a single poult near the same location as the previous check. Thereafter, brood checks indicated no poults and no brooding behavior by #0228, so we assumed that all 13 poults died within the first 2 weeks after hatch. Hen #0228 did not attempt another nest during 2020.

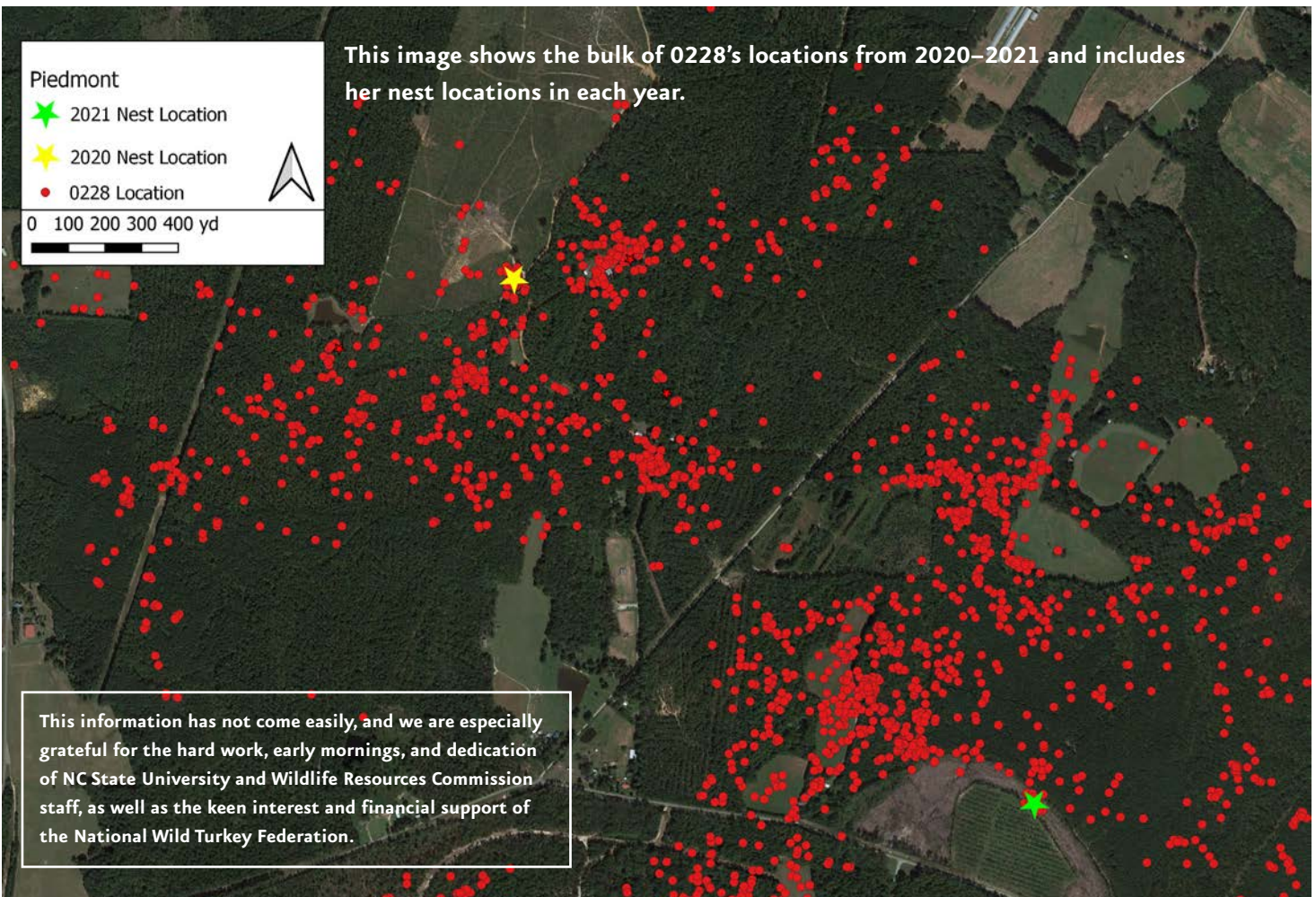
We continued to monitor 0228 and the other surviving female turkeys through the fall and winter, albeit with only a single GPS location each day. Based on these locations, the wintering range of #0228 totaled almost 2,000 acres. However, she spent most of her time on several small areas within that larger range which encompassed only 190 acres.

Hen #0228 survived the winter, so we again began intensive GPS monitoring of her reproductive activities in March 2021. Surprisingly, we found that #0228 had moved almost 2 miles from where we captured her in 2020. On April 17, more than a week later than in 2020, # 0228 began incubating a nest. Unfortunately, this nest was destroyed by a

predator before it could hatch. We continued to monitor #0228 in 2021, and she was still alive at the time this article went to press!

What's Next for the Research Project?

Our research project will continue to study wild turkeys in the Mountains, Piedmont, and Coastal plain of North Carolina through the end of 2022 and will ultimately encompass three breeding seasons. So far, we have identified over 250 nesting attempts, obtained 300,000 individual GPS locations, and documented survival rates for hundreds of female and male turkeys. We learned much by radio-tracking hen #0228, and she serves as an example of the perils of nesting and the critical importance of providing habitat. We look forward to the many stories of each individual turkey we monitor as we seek to develop a comprehensive understanding of wild turkey ecology across North Carolina, and we hope we can report on upcoming results in a future issue of *The Upland Gazette*. 🍂



Private Lands Conservation Efforts Are They Worth It?

By John Isenhour, Conservation Biologist, North Carolina Wildlife Resources Commission

Recently a few of my co-workers were discussing an article published in the *Wildlife Professional*—a publication of The Wildlife Society. This article presented a situation where reductions in Federal Farm Bill funding caused landowners to withdraw their property from a conservation program which enhanced bobwhite quail habitat. The discussion among Commission staff went back and forth, then one biologist interjected, “the article raises a lot of questions—such as, is it even worth it?” You would think that having the last 16 years of my career questioned by a co-worker would leave me dumbfounded. But the truth is, this question is batted around on a regular basis. Those of us that regularly work with private landowners ask ourselves this question every day as we decide how to prioritize our time and efforts.

At first glance, private lands are a poor location to manage a public trust resource such as wildlife. The most formidable challenge is likely the most basic, landowners choose how their property is managed and have the final say on everything that happens on the property. Many goals impact the decisions private landowners make concerning the management of their property. Some of these goals, such as maximizing financial return from the property, are generally easy to identify early in the technical assistance process. Other goals are a bit more fluid, taking a while to clearly define. “I want to do what is best for wildlife” is a common phrase that indicates objectives need to be better defined, but even well defined objectives can be impacted by unexpected factors. A health diagnosis can completely turn the landowner’s and their family’s lives sideways, rapidly moving land management down the list of day-to-day priorities.

Clearly, private lands come with challenges when it comes to habitat management. The knee jerk response presented in the *Wildlife Professional* article is to abandon private lands efforts, focusing energies on publicly owned lands. My biased rebuttal to this chain of thought is that public lands have challenges as well. For example, an agency may be mandated that their property “pays for itself” or generates funds to pay staff positions elsewhere in the agency. Such a requirement will steer the management of the property towards increasing long-term financial revenue, often at the detriment of habitat quality. Even when the overall goal of publicly owned land is habitat enhancement, external impacts such as a financial recession can stifle revenue resulting in staff reductions or other budgetary

constraints. So, with challenges affecting habitat management on private lands and public lands, it makes sense to take advantage of opportunities to optimize habitat management on all available land.

A Case for Habitat Management on Private Lands:

The first point that generally comes up when defending private lands management is the sheer number of privately held acres. Depending on your definition of private lands and whose estimate you reference, well over 80% of the North Carolina’s 34.4 million acres are privately owned. Estimating the proportion of this landmass that offers realistic opportunities for significant habitat enhancement is challenging to say the least, and factoring in landowner willingness makes it

impossible. Approaching these numbers pragmatically, even 5% of the private lands would make 1.37 million acres available for habitat enhancement.

A second point to consider, management on private lands is more economically efficient for state wildlife agencies than purchasing additional acres of public lands. The initial cost of purchasing property is a major expense that is absorbed by private landowners. However, management of public lands require salaries, insurance, retirement, and other benefits be paid to governmental employees. In addition, equipment, fuel,

mileage, infrastructure upkeep, and administrative costs each add to the overall price of habitat management on public land. Private land management programs generally use a small staff of biologists to provide technical assistance to the landowners. The landowners then use their own equipment, or hire contractors, to implement prescribed management practices. Often, there are financial assistance programs to offset implementation cost and income lost by managing specialized habitat types.

As mentioned earlier, a private landowner’s ability to manage their property as they see fit can be a negative from a longevity standpoint, but this flexibility can also be a positive. Private landowners do not have to work through the “red tape” to manage their property that most governmental agencies do, nor do they have to open their decisions up for public comment. In some situations, timber harvests, prescribed burning, or selective herbicide application on public lands get bogged down with project review or permit requirements. While oversight is needed on public lands, private landowners have fewer permit requirements unless their management impacts wetlands



MELISSA MCGAW/NCWRC

The author meets with an Anson County landowner and his friend and hunting partner to discuss ways they can meet their land management objectives.

or Threatened and Endangered species. Likewise, management plans for private lands are not required to go through public scrutiny. For example, revision to National Forest Management plans generally have a 90-day public comment period. During this period, any number of comments could, and often do, slow the approval process or impact management details.

Anytime public lands are impacted, there is the possibility that political influence may shape management decisions. The public has an interest in the land, and their elected officials are the conduit to have their voices heard. Varied opinions, coalitions, and constituency groups can apply political leverage that may delay or cancel management activities. By contrast, most private landowners want to avoid governmental influence as much as possible and just get their project completed. When working with private landowners, a single person or small group of folks define objectives, weigh the impacts, and make decisions concerning management. A direct line of communication between a natural resource professional and a landowner allows for clearer planning, more adaptability, and quicker decisions to be made.

There are biological reasons to manage wildlife habitat on private lands as well. Many species listed in the North Carolina Wildlife Action Plan and Species of Greatest Conservation Need (SGCN) can benefit from specialized management on private lands. Species such as Prairie Warbler require edge habitats between forests and fields. Prothonotary warblers must have mature bottomland hardwood forests for nesting sites here in North Carolina. Red-headed Woodpeckers can thrive in open pine stands with diverse understory. None of these species recognize parcel boundaries. In fact, many species that live in these specific habitat types migrate thousands of miles providing recreational opportunities for citizens from many counties, numerous states, and multiple nations. Specialized management on private lands not only benefits migratory

non-game species, but each of these habitat types support non-migratory game species such as white-tailed deer, wild turkey, and fox squirrel.

The Landowner is Key:

One of my college professors, Dr. Pete Bromley, once stated that successful wildlife management involves 90% management of people and 10% management of the resource. While this is an important rule of our profession, when working to enhance wildlife habitat on private lands I shy away from assigning a percentage and make a more blanket statement that “everything hinges on the landowner”. The landowner makes the final decision for their property. They must have the interest, the ability, and the resources to manage their property to meet their wildlife objectives.

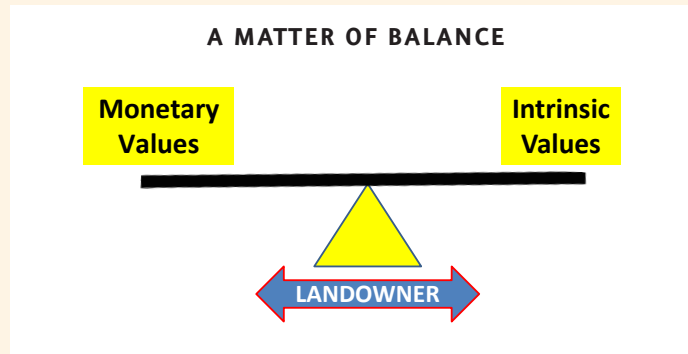
First and foremost, developing a successful private lands project requires a willing landowner. In 1937, Aldo Leopold

wrote, “It is hard to make a man, by pressure of law or money, do a thing which does not spring naturally from his own personal sense of right and wrong.” Even 85 years ago, it was clear that applying pressure is not the way to successfully recruit landowners to manage habitat. Instead, we must find effective ways to reach out to landowners who want to improve habitat on their property or those who contact us for guidance. These initial contacts provide an avenue to discuss opportunities for a given property. As with any relationship, the initial conversations set the tone for future guidance and define the best path forward for a given landowner.

Once the landowner is prepared to move forward, custom guidance can be provided to meet both the objectives of the landowner and the Wildlife Commission. Each tract of land is unique as are individual landowners. As management recommendations are given, landowners must weigh how it will impact their land and if it is something they would like to implement. This may seem like a simple process but can be a lengthy evaluation to balance monetary and intrinsic values.

Another timeless statement of Aldo Leopold was written in the essay Conservation Economics, “Conservation will ultimately boil down to rewarding the private landowner who conserves the public interest.” Nearly a century ago Leopold, considered the father of wildlife conservation, realized management on private lands was critical to sustain our native wildlife. Furthermore, as a landowner and land manager he had a keen understanding that human behavior and economic factors must be incorporated into any successful private land management effort. Today, more than ever, it is imperative that the efforts of landowners to manage their property at a higher level for wildlife not be a financial burden.

The Wildlife Conservation Lands Program offers a tax deferral for properties which are specifically managed for wildlife. Financial assistance programs through the Farm Bill and other sources offset conservation costs and offer compensation for foregone income associated with certain conservation practices. The Restoring American



Landowners' interests, abilities, resources, and limitations all factor into the level of management they are comfortable implementing on their property.



TIM HARRIS/HEADWATERS FORESTRY



Often the motivations for managing wildlife habitat on private land are intangible yet profoundly important to the landowner.

JOHN BIS

Wildlife Act (RAWA) is working its way through Congress. If passed, RAWA will provide a significant source of funding for various wildlife management programs across the country. Conservation professionals must continue working to ensure these programs prioritize funding for high quality projects that will benefit our wildlife resources and assist landowners to utilize these funding sources to better manage their property.

What it All Means for Wildlife in our State and Country:

A key point of the North American Model for Wildlife Conservation states, "Wildlife resources are conserved and held in trust for all citizens." While wildlife resources are held as a public trust, we know that most of these resources reside on and/or utilize privately owned lands for at least part of their life cycle.

Three critical aspects must be addressed to optimize habitat enhancement on private lands:

- Recruitment efforts must reach out to landowners who desire to improve wildlife habitat on their property. Landowners who do not have wildlife-oriented objectives should be directed to other natural resource professionals that can best meet their needs whether those are timber, recreation, or something else.
- Guidance provided to landowners must match their willingness and ability to manage their property. Recommendations should meet landowner's objectives while considering SGCN benefit. Follow-up is needed to ensure management is implemented as prescribed to meet habitat goals.

- Funding programs should be developed to make habitat management on private land financially feasible. Existing taxpayer funded conservation programs should promote projects which benefit the public trust of wildlife. Funding should incentivize a higher level of conservation, not simply increase monetary return for participants.

Under American traditions and laws, private landowners can and should have the right to manage their property as they see fit. Pressuring landowners who do not have any wildlife objective for their property is a futile exercise for wildlife agencies and conservation organizations. However, it is more critical now than ever that efforts be made to educate landowners regarding their vital role in sustaining

Private Lands and Private Landowners are vital to the management of wildlife in our state.

If you are interested in better managing your property for wildlife resources, please contact the Wildlife Conservation Biologist that serves your area. Contacts can be found at the following link. www.ncwildlife.org/WMDistrictContacts.

our wildlife resources and capitalizing on landowners who are willing to implement meaningful habitat enhancement on their properties. Whether native plantings in suburban backyards, forested riparian buffers to exclude cattle from streams, canopy gaps in a hardwood forest, or a field allowed to stand fallow, wildlife simply cannot be managed successfully across North Carolina, or our country, without effective private lands efforts. 🌿



CONSERVATION CHRONICLES

While cattle grazing pine understories can remove wildlife habitat, the Faircloth farm uses many innovative approaches to balance economic use of the land with conservation opportunities.

FRED DUFOUR

Against the Grain—a Brief Look at the Management Activities on the Faircloth Farm

By Benjy Strobe, SEFA/CURE management biologist, North Carolina Wildlife Resources Commission

Nestled near the heart of Sampson County lies a 7,800-acre ranch where things are done a lot different than on the typical North Carolina property. Most farms in southeastern North Carolina usually contain swine, poultry, row crop, or vegetable products. This farm is all about beef cattle production in an ecological friendly way and implementing best management practices on non-pastured areas. This can be quite challenging because anyone experienced land manager on the coast will tell you how difficult it can be to maintain quality vegetative cover, particularly on sandy lands.

Meet Anne Faircloth and Fred Dufour who decided they wanted to work with the land and mother nature to leave it in the best possible shape. In the past, the farm has implemented several Federal Farm Bill programs to help them achieve management goals. Currently, the owners take a wholistic “do it themselves” approach, and often they

have found going against typical schemes helps them achieve desired results.

The cattle herd (800 Angus cross cow/calf pairs and 50 bulls) is managed by Scott Warren. Grazing is rotational, and most of the pasture is Bermuda grass. On average, the cattle are on one pasture for a day before the cattle are moved to another pasture. This movement allows the Bermuda to remain a little taller to keep the sandy soils cooler. Cooler soils help prevent the grass from drying out therefore providing tender growth for grazing.

To keep the cattle calm, horses (instead of trucks or ATVs) are used to monitor and move the cattle from pasture to pasture. The cattle learn quickly when they are moving and usually are waiting at the gate. There are also fields of native switchgrass that are grazed in the summer and allowed to regrow for the winter to replenish root stocks and provide wildlife cover. In the late fall or early

winter, cattle get hay bales and corn silage that is grown on the farm. Cattle get most of their drinking water from rubber tire troughs, and livestock water is the biggest limiting resource on the farm.

Pasture management is very limited. Pastures do get soil tested yearly, and only when pH levels get low, do fields get limed. For the past three years, Bermuda fields have only received 20 units of nitrogen because the landowners are trying regenerative grazing (similar to what bison naturally do). Pastures are not overseeded. On occasion, fields are treated using herbicides when dog fennel or other unwanted plants become a problem in the pastures.

Waterways in the pastures are fenced to limit or prevent cattle access. Farm staff have not had to clean ditches since fencing them out due to the vegetation holding the soil in place. The natural vegetation growing along the fenced waterways provide year-round



BENJY STROPE/NCWRC

Left: This pond and drainage area was fenced to limit livestock access and provide wildlife habitat. Below: These young longleaf pines are growing next to older and taller loblolly pines that were previously thinned. When the loblollies are finally harvested, they will be replaced by longleaf.



BENJY STROPE/NCWRC

cover and corridors for wildlife. These buffers are managed by mowing one side every year in the late winter. Sometimes cattle are allowed to access the ditches to help recreate the natural flows and slopes instead of a man-made dug out cut, and since cattle are only there a short time the areas promptly regrow with vegetation.

Timber stands on the property have been and are heavily managed to promote tree and herbaceous understory growth. A few stands have recently been converted to silvopasture which is the deliberate integration of trees and grazing livestock operations on the same land. Timber that is grazed is only visited two or three times a year by the cattle.

After final harvest, loblolly pine timber stands are converted to longleaf, and the remaining loblolly stands have been or will be thinned. Most all the forested timber is

in either a growing season or winter burn rotation. Once the hardwoods are under control, the pine stands stay on a three-year burn rotation. If pine stands start growing too many red maple and sweet gum saplings, a dozer is brought in, and vegetation is walked down before treating with herbicides.

While not much hunting is carried out on the property, wildlife abounds with an increasing bobwhite population, lots of wild turkeys, and a healthy deer herd. Fox squirrels are common, and species like eastern kingbirds and eastern meadowlarks thrive in the open grasslands. Annual food plots for wildlife are scattered across the landscape in converted logging decks and several small fields to benefit game and non-game species. Other wildlife habitat enhancements include field borders along some of the hay fields and the

continuous corn field which is allowed to regenerate in weeds for a cover crop after harvesting.

Recently, efforts to promote native forbs (flowers) for pollinators were implemented using a mix purchased from Garret Wildflower Seed Farm which was planted along some of the farm road shoulders. In addition to providing pollinator habitat, this mix will help diversify and beautify the landscape.

While the farm could support more cattle under the current regime, Anne, Fred, and Scott are happy with how things are going and currently plan to maintain the herd at similar numbers. In their quest for ecosystem management, they have raised the bar and will continue to try new things and work to maintain or improve the habitats on their farm. 🐾

Precision Herbicide Use

Written and photographed by Clint Barden, Conservation Biologist, North Carolina Wildlife Resources Commission

Herbicide—for many folks, this is a four-letter word. People may have strong feelings about herbicide use for many reasons, but I frequently hear them described as “Indiscriminate killers”. While it is true that herbicide applications can damage or kill desirable plants, precision application techniques can reduce or eliminate these effects as well as significantly reduce the amount of herbicide needed.

My article in the Spring 2021 Upland Gazette detailed why it may be important to select which plants get the most sunlight to promote habitat for a focal wildlife species. Targeted herbicide applications can be an extremely useful method to exert this influence on the battle for sunlight and fine-tune the structure and composition of the vegetation on your property to achieve a desired plant community. Common uses of herbicide include controlling invasive plant species, releasing desired native vegetation, and controlling competition when establishing seeds or plant starts. This article will discuss ways in which herbicide can be used as part of your land management strategy in a deliberate, precise manner which reduces unintended damage to non-target plants and limits the amount of herbicide needed to achieve your objectives.

Cut and Paint

The “cut and paint” technique involves using a chainsaw or loppers to cut a woody stem off and immediately painting the stump with a concentrated herbicide solution. The herbicide is absorbed from the fresh wound and taken down to the roots. The whole surface of smaller stems can be painted while only the outer two to three inches of larger stems needs to be treated. Consult the herbicide label for more information. By removing the “spray” part of herbicide applications, off-target impacts are essentially eliminated.

Hack and Squirt

The “hack and squirt” application is similar to cut and paint in that a concentrated herbicide solution is applied to the target plant, but instead of cutting down the stem the herbicide is injected directly into it. This is commonly accomplished by using a hatchet or machete to “hack” a pocket or cup into the tree stem into which the herbicide is applied with a common utility spray bottle. Be sure the hack penetrates the cambium layer below the bark, so the herbicide can be translocated to the roots. The number of hacks per tree varies with the size and species targeted, but one hack for every two to three inches of tree diameter is usually about right.

Girdle and Squirt

Larger stems or ones with thick bark can be good candidates for replacing the hatchet with a chainsaw. The chainsaw can be used to cut a shallow groove around the tree into the cambium layer into which the herbicide solution is squirted.

Timing of Application

Choosing your window of opportunity to apply herbicide can also greatly increase the precision of application. Certain plants,



Cut and paint is an effective way to treat undesirable plants focusing on any stem with a diameter larger than one half inch. Be sure to know which chemical will be effective on your target species.

often non-native ones, are active at times in which more desirable vegetation is dormant. Privet and multiflora rose are two examples of non-native shrubs that often stay green over the winter months. These plants can be receptive to a foliar spray application on a warm day during this season which reduces the number of potential off-target impacts because many more desirable plants are dormant.

Fescue is one example of a non-native plant species which has a negative influence on habitat for many wildlife species. Fescue is a cool season grass, and in many “old field” plant communities it is coexisting with desirable species such as goldenrod or milkweed. By waiting until after the first hard frost to spray the fescue, the desirable warm season plants will be dormant and therefore not receptive to a foliar spray while the fescue is actively growing and susceptible to the herbicide.

Selective Herbicides

There are several selective herbicides available that are active only on grasses while others are active only on broadleaf plants. Some broad-spectrum herbicides like imazapic are selective and can be used to control some, but not all, species of both grasses and forbs. Identifying the vegetation present, understanding the objective, and researching the correct chemical for the job can greatly increase success and reduce damage to beneficial plants.

Use Herbicide Dye

Adding dye to an herbicide solution can add a lot of clarity to your application technique. The small amount of herbicide dye required



Left: Land managers are in the process of using hack and squirt herbicide applications to control the privet and tree-of-heaven along this field edge. Bottom Left: This photo, taken in winter, shows Japanese barberry shrubs are leafed out and receptive to herbicide when many native plant species are not.



to color a spray bottle or backpack sprayer is well worth the cost because it makes run off and spray patterns very easy to recognize. This instant feedback helps the applicator gauge the best spray pattern or amount of liquid required to get the job done. Avoiding runoff, drips, and overspray helps to prevent off-target injury. The addition of color in the solution also easily identifies what has been treated to prevent reapplication which reduces costs and unnecessary use of herbicide.

Summary

Hopefully, the techniques described above offer some ideas on ways in which herbicides can be used safely, efficiently, and effectively on your property to improve wildlife habitat. As with any herbicide application, it is critical for the applicator to read, understand, and follow the instructions provided in the herbicide container label. Everything you need to know about application methods, rates, and required safety equipment can be found in this document. With that said, there are a tremendous amount of herbicide options on the market, and it can be difficult to know where to begin. If you need help selecting the right herbicide to help achieve your wildlife habitat management objectives, you can get free guidance by contacting a NCWRC Biologist in your district. Contact information can be found at the

One Bottle, Many Applications

Any given herbicide can be effective on some plant species while less effective or even ineffective on others. While it is possible to carry multiple containers containing different herbicides which will be effective on the species you intend to control, it is not very practical. Dr. Craig Harper, Extension Specialist from the University of Tennessee, solved this problem by developing a mixture of triclopyr and imazapyr which is effective across a wide range of woody species. This combination produces a single herbicide solution which will serve most hack-and-squirt or cut-and-paint needs from one bottle.

The volumes given are based on using a common 24-ounce utility squirt bottle. Other size bottles can be used and the volumes adjusted accordingly, but it is important mix the ingredients in the same ratio and in the order listed to prevent gelling.

TO A 24-OUNCE SQUIRT BOTTLE, ADD:

- 1ST - 50% - 12 OUNCES TRICLOPYR 3
(EX. GARLON 3A)
- 2ND - 40% - 9.5 OUNCES WATER
- 3RD - 10% - 2.5 OUNCES IMAZAPYR
(EX. ARSENAL AC)
- 4TH - ~0.5 OUNCE BLUE HERBICIDE DYE
(OPTIONAL BUT RECOMMENDED)



GABRIELA GARRISON/NCWRC

All About Magnificent Milkweed

By Gabriela Garrison, Eastern Piedmont Habitat Conservation Coordinator,
North Carolina Wildlife Resources Commission

If you are aware of current events in the wildlife world, you are familiar with the plight of the monarch butterfly (*Danaus plexippus*) which is a species showing rapid population decline and proposed for listing under the U.S. Endangered Species Act. Deforestation, land conversion, climate change, and pesticides are all contributing factors. One of the more important reasons for monarch declines is the loss of milkweed (*Asclepias* spp.) which is the butterfly's larval host plant.

Despite the toxic cardenolide compounds produced by milkweed, monarch caterpillars have developed the means to feed exclusively on these plants and thrive. Without

milkweed, their life cycle cannot be completed, and the species would disappear. Milkweed also provides valuable nectar and pollen resources for countless bees, wasps, butterflies, and other beneficial insects. If you see a milkweed in bloom, it will almost certainly be covered in insects.

There are 72 species of milkweed native to North America and Canada; 18 species are native to North Carolina. While this may seem like a robust number, scientists do not have the full picture of how many of these species are readily used as host plants. North Carolina's milkweed species are deciduous and found in a wide range of habitats from open fields and disturbed roadsides to

riparian areas and pine woodlands. Plant structure and flower color is highly variable to include broad and narrow leaves along with opposite or whorled leaf arrangement and hairy or hairless stems. Height can range from low-growing and sprawling to six feet tall. Surely, you have seen common milkweed (*A. syriaca*) growing happily in a field. When the bloom has passed and the plant sets seed, you might notice a large pod-like structure that develops. When it erupts, you will see milkweed seeds attached to fluffy hairs that aid in wind dispersal. In addition to reproduction by seed dispersal, some species grow new shoots from buds on their roots. These new growths can

Left: This American Lady butterfly (*Vanessa virginiensis*) was enjoying the nectar of a butterfly milkweed plant along with several bumble, leaf cutting and sweat bees that were busy foraging on adjacent blooms.

emerge several feet away from the original plant.

Let's briefly address milkweed toxicity since I mentioned cardenolides which are a class of steroids with varying chemical structure. These compounds are present in every part of the plant and used as a defense mechanism against other insects, herbivores, and parasites. Monarchs have developed the physiological capacity to metabolize these compounds and use them for their own defense. The amount of cardenolides varies across milkweed species, so basically some species have higher or lower concentrations than others. As an example, it is thought that butterfly (*A. tuberosa*), swamp (*A. incarnata*), and whorled milkweed (*A. verticillata*) have lower amounts of cardenolides. In general, milkweed has a bitter taste and is mostly unpalatable to other animals. With that in mind, let me ask a question: is anyone raising their hand because they have lost milkweed plants to deer, rabbits, or something else? I'm raising my hand as well. The rabbits in my yard seem to enjoy foraging on my milkweed. So, the idea that milkweed is only toxic in very large quantities may have some merit. Having said that, please do not tempt fate: keep your dogs, cats, chickens, or other pets and livestock away from all sources of milkweed.

In the spring of 2020, shortly after the official beginning of the Covid-19 pandemic, I received a very fateful email. Through the North Carolina Pollinator Conservation Alliance (NCPCA) network, a partner organization, BASF, needed to find willing recipients for milkweed plants. In short, BASF typically grows milkweed as appreciation gifts for their employees. However, with stay-at-home orders in place at the time, no one was available to collect the plants. Instead, around 150 plants were offered to NCPCA partners. NCWRC biologists claimed around 100 plants and distributed them to private landowners involved in our Private Lands Program. As the summer progressed, I was incredibly fortunate to meet

the man responsible for growing the milkweed. Dr. Jonathan Lelito is a Senior Entomologist and Team Leader for the Insect and Plant Propagation Program at BASF. As it turns out, he is also a monarch and plant enthusiast!

As Dr. Lelito and I continued the monarch discussion and shared admiration of Doug Tallamy, a noted expert on interactions between insects and plants, Jon offered to grow more milkweed for our cause in the fall of 2020. In all my years as a wildlife biologist, I cannot recall such an amazing and gracious offer for this urgent and worthy cause. Last October, we were able to plant almost 900 milkweed plants across the State, including common, swamp, and butterfly milkweed.

You might think the story ends here, but it does not. Jon grew more milkweed this spring! I would be remiss if I did not mention that he has also provided milkweed for

Dr. Jon Lelito is an Entomologist and Leader for the Insect and Plant Propagation Team at BASF. He is also the mastermind grower behind all the milkweed we have been fortunate to plant across the State.

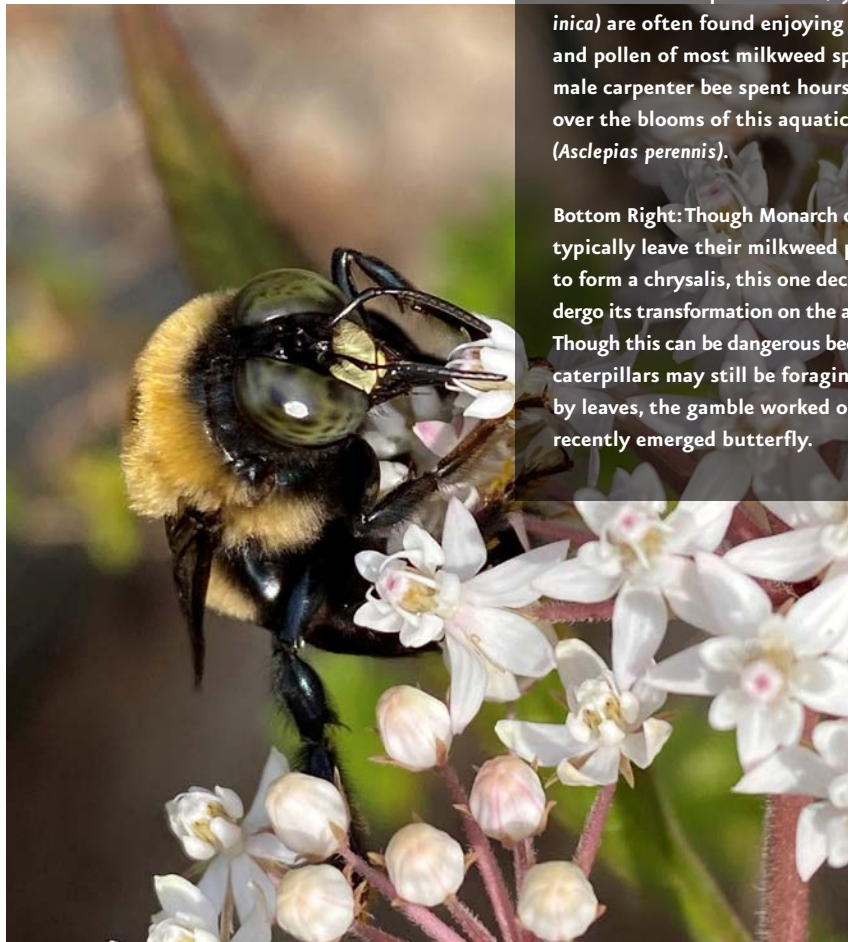
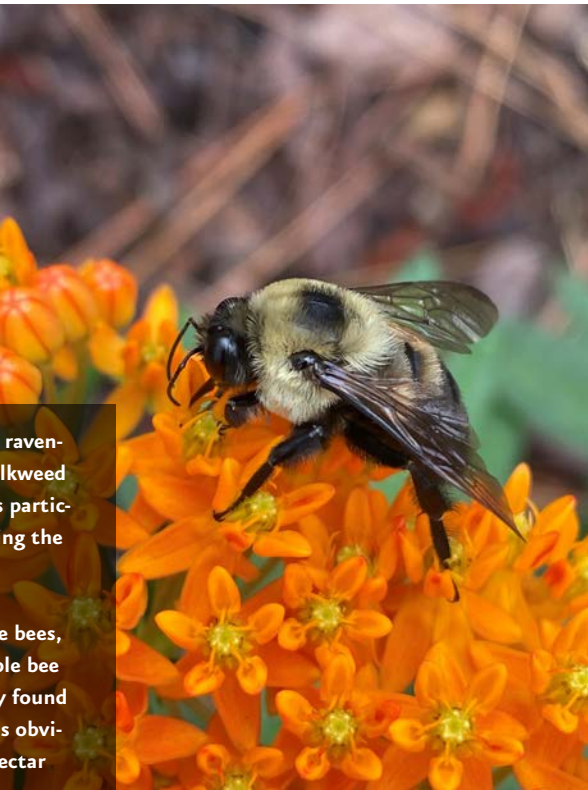


DR. JON LELITO



Top Left: Monarch caterpillars are ravenous eaters that consume many milkweed leaves during their life cycle. This particular caterpillar was intent on eating the milkweed's developing seed pod.

Top Right: Many species of bumble bees, including this brown-belted bumble bee (*Bombus griseocollis*), are commonly found on milkweed plants in bloom. It is obvious this is a favorite pollen and nectar choice as they will select this flower even if several other plant species are in bloom.



Bottom Left: Carpenter bees (*Xylocopa virginica*) are often found enjoying the nectar and pollen of most milkweed species. This male carpenter bee spent hours combing over the blooms of this aquatic milkweed (*Asclepias perennis*).

Bottom Right: Though Monarch caterpillars typically leave their milkweed plant host to form a chrysalis, this one decided to undergo its transformation on the actual plant. Though this can be dangerous because other caterpillars may still be foraging on nearby leaves, the gamble worked out for this recently emerged butterfly.



ALL PHOTOS BY GABRIELA GARRISON/NCWRG



COMMON MILKWEED
Asclepias syriaca L.
 MILKWEED FAMILY

various other entities including the North Carolina Department of Transportation, the Eastern Band of Cherokee Indians, Bee City USA, and the Towns of Apex and Chapel Hill.

In April and May 2021, we planted and distributed almost 3,000 milkweed plants across the State! In addition to the three species from last year, Jon was able to add three more: whorled, purple (*A. purpurascens*), and green comet (*A. viridiflora*). Milkweed was planted in a variety of locations including government-owned lands, commercial and industrial areas, land trust properties, schools, and privately owned land. We are working on mapping all the locations that have been planted in relation to protected and priority lands across the State, so we can determine where milkweed should be located if we are able to continue this incredible work.

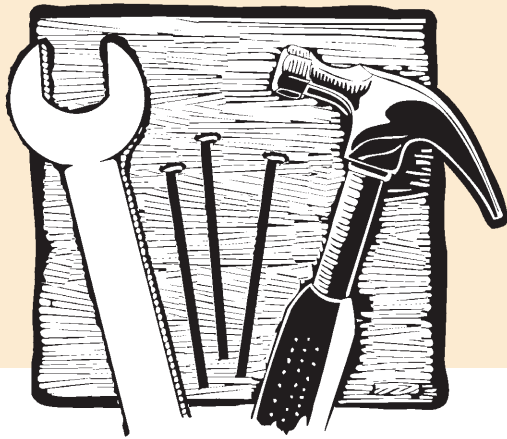
Certain species of milkweed are becoming easier to find across the southeastern United States. There is more demand, so growers are increasing their supply. If you are interested in monarchs, support your local nurseries and plant milkweed that is native to your region. The following programs are helpful to determine which species are appropriate for your specific location:

The Biota of North America Program's (BONAP) North American Plant Atlas
 • <http://bonap.net/NAPA/TaxonMaps/Genus/County/Asclepias>

The Vascular Plants of North Carolina
 • https://auth1.dpr.ncparks.gov/flora/plant_list.php

The USDA-NRCS PLANTS Database
 • <https://plants.usda.gov/home>

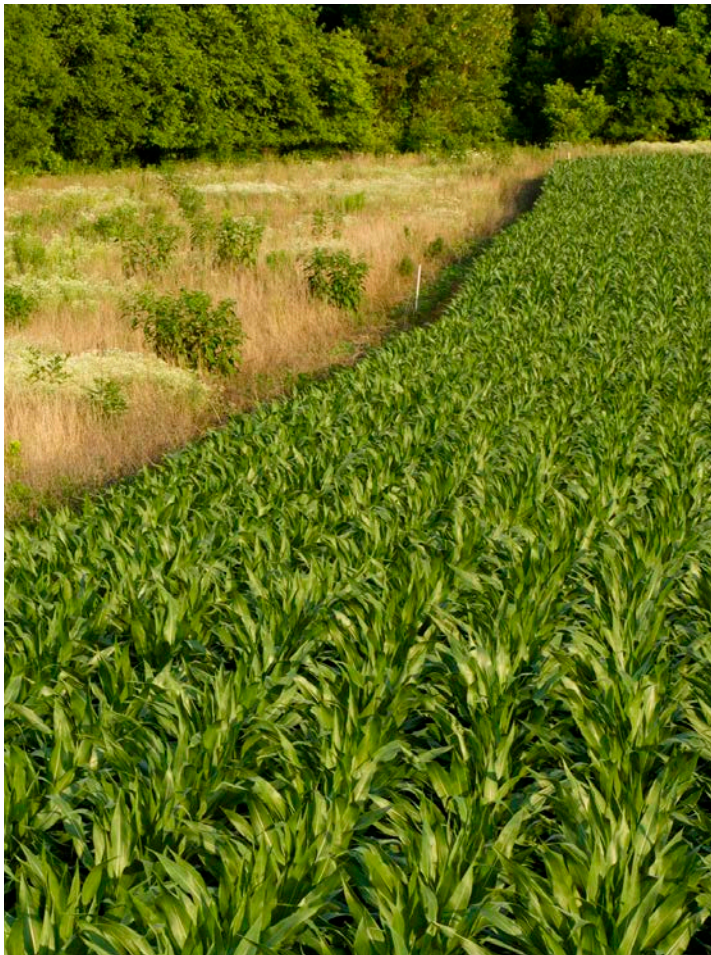
While it may seem daunting to combat species decline, in this situation, everyone can play a role in helping monarch butterflies by purchasing native milkweed and planting it on your landscape! Even if you do not immediately attract monarch butterfly, you will be amazed by the plethora of insects that will swarm to your plants. 🦋



Land Managers' **TOOLBOX**

By Benjy Strobe, CURE management biologist,
North Carolina Wildlife Resources Commission

The Benefits of a Land Management Plan



MELISSA MCGAW/NCWRC

Maintaining effective field border habitat requires a management plan in order to determine when and where to burn, disk, spray herbicides, and perform other vital management activities.

Many contributors to the *Upland Gazette* have mentioned the importance of a management plan in their articles. Often, these authors recommend you develop a plan to guide the management of your property, but I do not recall an article which has shared specific details on what goes into a property management plan. Perhaps this article will shed some light on the subject.

A basic management plan should include a current description of the property, landowner objectives, a map identifying property boundaries, and text describing the practices needed to meet the objective. Before you even begin, it is very important to have clearly defined objectives for your property. A higher level, comprehensive management plan should have all the above information and additional details at the management unit level which may include soil information, timing of activities, and who does the work for each stand. You will need this detailed information to develop a plan if applying for Federal Farm Bill or other financial assistance programs.

Landowner objectives should be used to define the overall purpose of the document and help resource professionals provide quality technical guidance for your property. The objectives help a landowner set goals for what the property should look like or identify what they want to accomplish with the property. Goals may address aesthetics, recreation, wildlife habitat, and/or financial return interests for the property. These goals can help to identify which professionals should be involved in developing detailed management prescriptions.

Many North Carolina properties are made up of a mosaic of fields and varied forest stands. In this situation, it becomes important to define an objective for each unique management unit to reach overall goals or property objectives. An example might be a landowner wants to improve aesthetics and quail habitat for the property. That



MELISSA MCGAW/NCWRC

Site visits and good communications with professionals are critical to making management plans work for landowners. Wildlife Resources Commission staff can help.

is fine for the overall property, but it is important to develop more details at the stand level. An example stand objective for a fescue field on the property might be “convert fescue to native grasses and forbs”. This process defines exactly what needs done on that stand and helps a landowner to work to meet the overriding goal of aesthetics and quail habitat.

Property and brief individual stand descriptions should provide a current snapshot of the existing vegetation and land features. This information should provide enough information to determine the management activities needed to transform or maintain that stand based on the objective. A brief description of the soils is also beneficial to include because the soil type will determine what plants can grow and will be needed for any prescribed burn plans. For prescribed burning, one must at least identify whether a given stand contains mineral or organic soils.

Stand maps should be labeled to match the site descriptions and provide the acreage of the site. Using the measuring tool available on most computerized maps is handy for figuring important measurements such as length of fire lines, how many feet of road that needs daylighting, potential sites and acreage for woodland openings, or how many shrubs are needed to plant in a proposed area.

The Management Activities Section of a Management plan should provide the “who and when” or prescription details to create the desired conditions. This may be in a table form or a block of text. Do not forget spot treatments, roads and trails, and any mowing regimes (timed to avoid bird nesting) if something must be mowed. The activities section is one place where herbicide and planting prescriptions can be placed, or these can be put in a separate section if that prescription is going to be used multiple times in different areas.

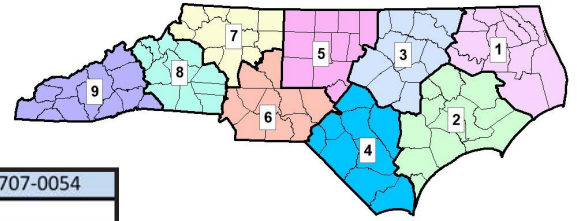
Landowner objectives should be used to define the overall purpose of the document and help resource professionals provide quality technical guidance for your property.

An example would include something like the following:

- Contract (or name of person doing the work) spray glyphosate (2 quarts per acre) on fescue field in September of 2022.
- Respray spring of 2023 after green up.
- Following the second chemical burndown, the landowner will plant a mix of three pounds of Carthage switchgrass with ¼ pound black-eyed Susans, ¼ pound common milkweed, and 2 pounds of partridge pea to the acre.
- If needed, do a high mowing to control weeds three months after planting.

Having a well-developed plan to achieve your land management goals is essential for making good decisions on how and when to do activities. Contact your local NCWRC Wildlife Conservation Biologist if you need assistance or advice on your land and wildlife management goals (www.ncwildlife.org/WMdistrictcontacts). 🌿

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