



CHAPTER 8 PRIVATE LANDS CONSERVATION

8.1. Private Lands in Tennessee

PRIVATE LANDS ARE ANY LANDS, such as family farms or private woodlands, that are not public lands (held by federal, state, county, or local governments), excluding Indigenous People's trust lands (Law Insider [date unknown]). In the state of Tennessee, 89% of land is privately held. Eighty-three percent of forestland in the state is privately owned. An estimated 17 percent of Tennessee's forestland is publicly-owned and administered, with 5 percent being managed by the Forest Service as National Forests and 12 percent held by state, local, and other federal agencies (TDF 2020). Thus, landowners are integral to achieving natural resource conservation objectives. A study of 24 vertebrates listed under the US Endangered Species Act across various categories of land ownership found that over 31 years, imperiled species lost the least amount of habitat on federal lands (3.6%), whereas losses on private lands without conservation easements were twice as high (8.1%) (Eichenwald et al. 2000).

Despite the clearly demonstrated need for conservation activities on private lands, however, there are numerous challenges to their successful implementation. Examples of such hurdles include the following:

- Landowner perceptions of conservation as a practice
- Landowner ability to evaluate habitat value
- Landowner access to information on project design, execution, and/or maintenance

Photo credit: Farm along the Duck River in central Tennessee / Corey Giles

- Prioritizing among various conservation needs
- Selecting appropriate seed mixes or plant material, and installation expertise
- Access to labor and equipment needed to construct conservation measures
- Means to fund project installation, maintenance, and/or monitoring
- Long-term relationship building and planning for continued landowner engagement on the part of technical advising organizations.

This document, developed as a component of Tennessee’s 2025 State Wildlife Action Plan (SWAP), is intended for use by both property owners who may be newly acquainted with conservation strategies and natural resources professionals who provide technical expertise to the public. The resources included in this chapter are not intended to be all-encompassing or static, but rather to provide a starting point and reference to support decision-making for conservation efforts on private lands in our state.

Organizations that provide technical assistance to landowners need internal plans for building multi-year relationships and offering long-term support. It is the responsibility of these providers to stay current with the latest implementation tools. Educational resources and the science of conservation itself are ever-expanding, making it a challenge to keep all options in mind. Similarly, sources of external financial and technical support fluctuate over time. For these reasons, conservation practitioners are encouraged to revisit the content provided, making note of programs made available post-2025, as well as changes to existing ones presented here.

8.2. Type, Location, and Importance of Tennessee Private Lands to Biodiversity Conservation

Summary of Status and Importance of Private Lands in Tennessee

- Tennessee lands are 89% privately owned, and roughly 88% of private lands in Tennessee remain unprotected.
- However, when focusing on private lands ranking high to very high priority for SGCN conservation, only 28% remain unprotected.
- The top five concerns of Tennessee Family Forest (10+ acres) owners are property taxes, keeping land intact, government regulation, trespassing/poaching, and insects/disease.
- Management to maintain the “working” part of the privately-owned landscape often overlaps with, reinforces, or complements management required to maintain ecosystem health and wildlife values because land productivity is highly dependent on ecological services such as soil formation and water provision.
- Environmental concerns are the common link between private landowners and agencies, organizations, and programs seeking to achieve wildlife and plant conservation goals. When considering programs, partners, and approaches to conservation management, landowner priorities drive the decision-making process.
- Support for private land conservation is addressed broadly as programs that benefit stewardship and programs that benefit land protection. A representative, but not exhaustive, list of each type of program is provided, along with examples of specific projects.

The term “working lands” is often used to refer to lands in a natural or semi-natural state, which provide habitat and many ecosystem service benefits, but which also provide economic returns in some form, such as through grazing, timber, agriculture, or recreation. Examples include managed forests, leased hunting land, grazing pastures, or pollinator strips. Such lands also require



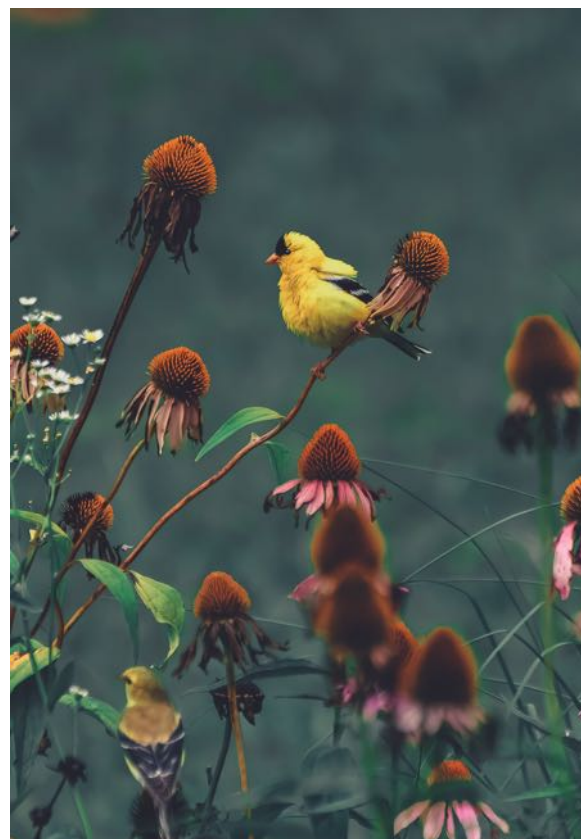
Bottomlands in west Tennessee / Mark Godfrey

management by landowners for a variety of reasons, such as to protect or enhance soil and water resources, restore or maintain healthy forest for harvest, or feed livestock. Management to maintain the “working” part of the landscape often overlaps with, reinforces, or complements management required to maintain ecosystem health and wildlife values. In fact, “agricultural [and other working lands] productivity is highly dependent on ecosystem services, including pollination, soil formation, water provision, and genetic diversity” (Vergez 2025).

8.2.1. High Priority Lands for the Conservation of SGCN

As explained in Chapter 3, the SWAP terrestrial, aquatic, and karst habitat prioritization models use Element Occurrence data and each species’ preference for an ecological system, its relative imperilment, and its likelihood of persistence to rank habitats as very high, high, medium, and low priority for conservation of SGCN.

The following tables list priority habitat acreages using the priority model that combines terrestrial, aquatic, and karst habitat priorities, as well as the terrestrial model alone. The tables illustrate the amount of combined high to very high (HVVH) terrestrial priority acreage by Tennessee Level III ecoregion (Table 8.1) and ecological system type (Table 8.3). Table 8.2 shows ownership of HVVH combined priority acreage. It is worth noting that the overall total of high to very high combined priority acres in Tennessee is 2.8 million acres greater than that designated as HVVH in the terrestrial model alone because adding the aquatic and karst priorities increases the priority total.



American Goldfinch (*Spinus tristis*) on coneflower / Greg Wathen

Table 8.1 Tennessee SWAP high to very high terrestrial priority land by ecoregion

TN Terrestrial Ecoregions (west to east)	Total acres	High to very high SWAP priority in acres
Mississippi Alluvial Plain	547,789	167,703
Mississippi Valley Loess Plains	2,918,278	232,731
Upper Gulf Coastal Plain (SE Plains)	3,290,336	200,733
Interior Plateau	10,055,714	2,905,994
Cumberland Plateau (Southwestern Apps)	3,084,634	1,273,130
Cumberland Mountains (Central Apps)	569,183	469,966
Ridge and Valley	4,930,290	785,209
Blue Ridge	1,578,928	1,036,414

Table 8.2 Tennessee SWAP high to very high combined priority land
by ownership

Ownership Category	High to very high SWAP priority in acres
Federal	1,193,295
State	758,996
County	46,263
Local	47,498
Other land in acres	3,723
Private Protected	84,964
Private Easement	160,022
Private Leased for WMA	16,306
Private Unprotected	7,562,555

Table 8.3 Tennessee SWAP high to very high terrestrial priority land by ecological system

Ecological System Name	Acres high to very high priority
South-Central Interior Small Stream and Riparian	1,467,884
Southern Interior Low Plateau Dry-Mesic Oak Forest	1,214,095
South-Central Interior Mesophytic Forest	1,176,609
Allegheny-Cumberland Dry Oak Forest and Woodland	886,583
Southern Appalachian Oak Forest	664,687
Pasture	433,299
East Gulf Coastal Plain Large River Floodplain Forest	226,355
Southern Ridge and Valley / Cumberland Dry Calcareous Forest	222,645
Appalachian (Hemlock)-Northern Hardwood Forest	158,643
Southern and Central Appalachian Cove Forest	147,762
Mississippi River Low Floodplain (Bottomland) Forest	124,002
South-Central Interior Large Floodplain	118,311
Old Field / Successional	77,673
East Gulf Coastal Plain Small Stream and River Floodplain Forest	46,154
Mississippi River Riparian Forest	37,799
Eastern Highland Rim Prairie and Barrens	33,307
Southern Appalachian Northern Hardwood Forest	15,577
Nashville Basin Limestone Glade and Woodland	10,346
Central and Southern Appalachian Spruce-Fir Forest	4,995
Southern Appalachian Low-Elevation Pine Forest	4,608
Mississippi River Bottomland Depression	531
Central Interior Highlands and Appalachian Sinkhole and Depression Pond	15

CONSERVATION ON PRIVATE LANDS

The majority of land is privately owned in much of the eastern US, including Tennessee (which is approximately 90% private). In recognition of this fact, in recent decades many conservation programs at the federal and state level (such as the Farm Bill and Tennessee Division of Forestry's Landowner Assistance Program), as well as private entities (such as Quail Forever, The Nature Conservancy, and TennGreen) provide support and advice directly to private landowners.

Support takes many forms and is voluntary on the part of the landowner—from advice to planning to training to cost share to provision of volunteer or paid labor or specialized equipment to conservation easements to grants.

Private lands conservation programs are focused on helping landowners to manage their land for wildlife, native plants, forest health, and other forms of biodiversity—depending on the goals of the landowner and the goals of the assistance program.

Since 2020, a **Rockvale couple** has been collaborating with USFWS, TDEC, TWRA, and others to restore populations of **Pyne's ground-plum** (*Astragalus bibullatus*) on their property. Likewise, since 2021, **Mr. Bob Loftis** has been working with USFWS and TDEC to bring back a population of **leafy prairie-clover** (*Dalea foliosa*) on his. Both projects are providing habitat benefits for important and declining wildlife species as well.



Left: leafy prairie-clover (*Dalea foliosa*); right: Pyne's ground-plum (*Astragalus bibullatus*) / Robert Cogburn, PFW/USFWS

A TALE OF TWO PROJECTS

The two projects featured here are in Rutherford County, TN and are being led by the landowners working with **Robert Cogburn, a Partners for Fish and Wildlife (PFW) Program Biologist**. Both were initiated to benefit plant species federally listed as endangered. By tending to the requirements of these species, both projects also are benefiting many more native plants, as well as wildlife species. One of these is the **Streamside Salamander** (*Ambystoma barbouria*), a Species of Greatest Conservation Need (SGCN) on the Loftis property, and cave-dwelling species on the Rockvale property.

Both of these properties face similar threats: their limestone glades are threatened by dense thickets of cedar. This is a problem that open habitats, such as grasslands, glades, barrens, balds and savannas are facing across the country—largely as a result of fire suppression. Fire likely prevented cedars from shading out limestone glades until suppression began in the early 1800s (Estes et al. 2016). Urban sprawl and land development also pose threats to limestone glades and the species that occur there.

The overarching theme of these two restoration projects, unsurprisingly, involves cedar removal to benefit SGCN. But one each is unique.



Loftis prescribed burn conducted with assistance from TDEC, / Robby Cogburn, PFW



Loftis property in spring, after prescribed burn / Robby Cogburn, PFW

CONSERVING THE PLANTS OF OPEN HABITATS

The Rockvale landowners' property is 50 acres, with 1/4 acre actively managed for **Pyne's ground-plum**. The landowners are extremely dedicated to their project for its ecological values, and they have personally undertaken all management activities, such as hand-cutting and removing cedars and mowing every February (to reduce competition from other plants). They have received technical assistance and volunteer labor from the Tennessee Dept. of Environment and Conservation (TDEC) and PFW. The landowners have been working with PFW and the Missouri Botanical Garden to monitor Pyne's ground-plum and collect seeds for future propagation and reintroduction efforts across its native range.

The Loftis property is 14 acres, with eight under management to benefit **leafy prairie-clover**. It has received stewardship support through a PFW agreement, and the property will soon receive a conservation easement from TDEC. The agency wishes to acquire 71 acres adjacent to Loftis, and with his managed property, the intention is to designate the entire area as Rocky Hill State Natural Area (SNA). (The Loftis property ownership will remain private.)

Loftis restoration began with opening the canopy by cutting and mulching dense areas of cedar. Next they conducted a prescribed burn in the spring of 2022. Because glade soil is thin and rocky, plants do not grow back quickly, so the recommended fire interval is likely to be from 4 to 6 years.

Private Lands Conservation Partners

[Partners for Fish and Wildlife/USFWS \(PFW\)](#)
[Tennessee Wildlife Resources Agency \(TWRA\)](#)
[Tennessee Dept. of Environment and Conservation \(TDEC\)](#)
[Tennessee Valley Authority \(TVA\)](#)
[University of Alabama](#)

(Note: These partners are specific to the projects described here, but there are many more agencies and groups working with private landowners in TN.)

LANDOWNERS AS RARE AS THE PLANTS THEY ARE RESTORING?

Historically, cost-share programs for landowners have been marketed either to farmers or hunters; however, more and more landowners do not fit those categories. **Mallory Tate Cogburn, Wildlife Manager for TWRA**, has also supported these projects. Both she and Robert Cogburn are interested in reaching a broader private lands conservation audience, and they believe those landowners are out there. Mallory Tate says, "Landowners who are directly interested in SGCN will have far more impact, and their results will be more reliable because they have buy-in. Land is the one thing we can't make more of; it's the limiting resource for 90% of our SGCN. In future, private land will be more impactful than public land because of connectivity and overall acreage."

For these two sets of landowners, the ecosystem's response to their efforts has been their reward. Pyne's ground-plum went from a population of only 41 plants that were not producing fruit in 2015 to well over 740 individuals by 2023, which began producing fruit the year after cedar removal! The leafy prairie-clover, discovered by Loftis (an amateur botanist) on his own property, went from a count of 8 plants to 45 plants two years after cedar removal. And the Streamside Salamander T-shirts he enthusiastically had made are now his favorite garment!



Rockvale property restoration photos from left to right: 1) Monitoring of cedars prior to removal, 2) Immediately post-removal of cedars, 3) Monitoring of restored glade. Photos by Robert Cogburn, USFWS PFW

8.2.2. Ownership and Protection Status of Lands in Tennessee

The following figures focus on protection status and ownership of land in Tennessee. Habitat priority is illustrated using either the SWAP combined habitat priority model (Figs. 8.1 - 8.4) or using only the terrestrial model (Fig. 8.5).

Protected lands are defined as those held by a governmental agency (local, county, state, or federal), lands held by private conservation organizations (typically only temporarily before being transferred to a governmental organization), as well as lands on which there is an easement held by another party and which may restrict certain activities on the property in perpetuity. (In the latter instance, the easement may be implicitly intended for conservation of natural resources, or it may be focused on preservation of other resources, such as farmland, heritage, or recreation. These properties are still considered protected as such easements will restrict future development on the site, among other activities.)

Private lands that remain unprotected include lands leased to Wildlife Management Areas, as these leases may be revoked, and all other privately held land. Unprotected private lands are assumed to be subject to potential future habitat loss. Since Tennessee is ~90% privately-owned, it is unsurprising that the vast majority of land remains unprotected (Fig. 8.1).

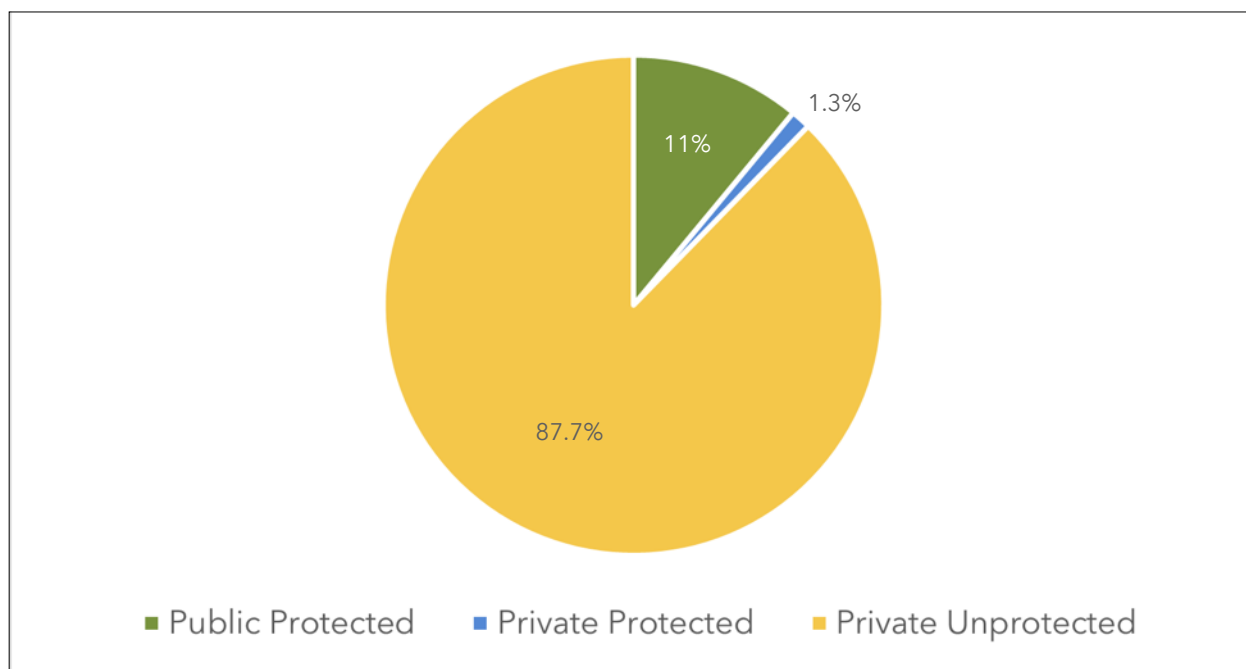


Figure 8.1 Tennessee land protection status, public and private

However, Fig. 8.2 shows that a much smaller percentage (28%) of private lands that rank as high to very high combined priority for SGCN conservation remain unprotected.

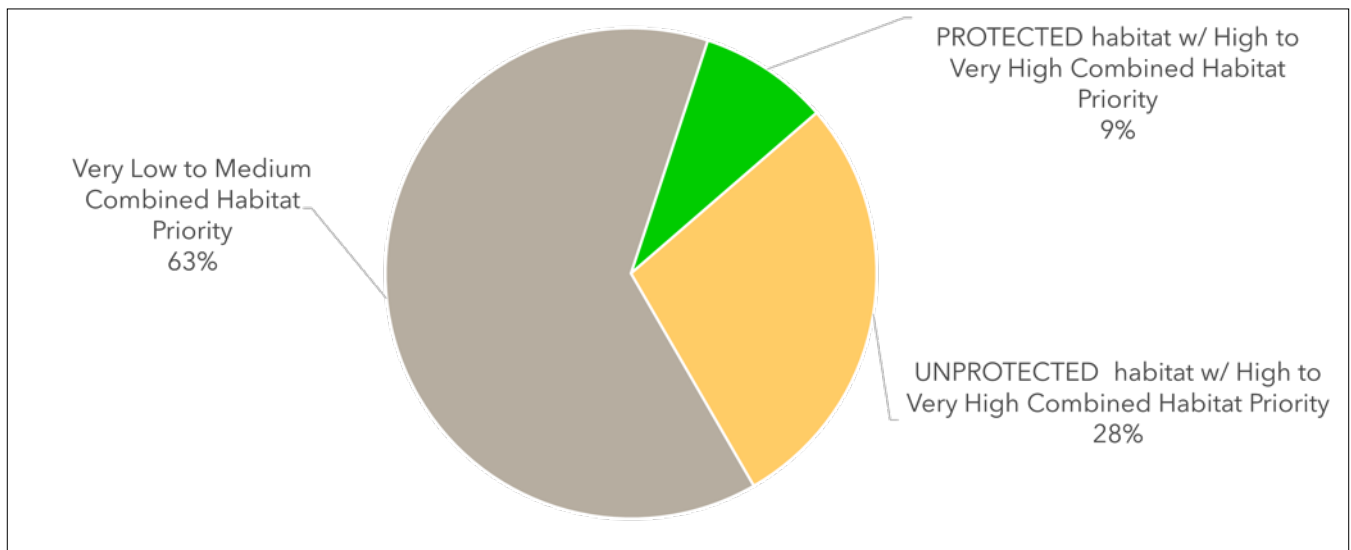


Figure 8.2 Tennessee combined high to very high habitat priority and land protection status

The next two figures show Tennessee land protection status for aquatic species and caves (i.e., subterranean habitats and cave species). Fig. 8.3 assesses only high to very high combined priority lands important to conservation of aquatic habitats, while Fig. 8.4 assesses all lands that contain caves (i.e., surround cave entrances) without regard to combined priority status according to the SWAP model.

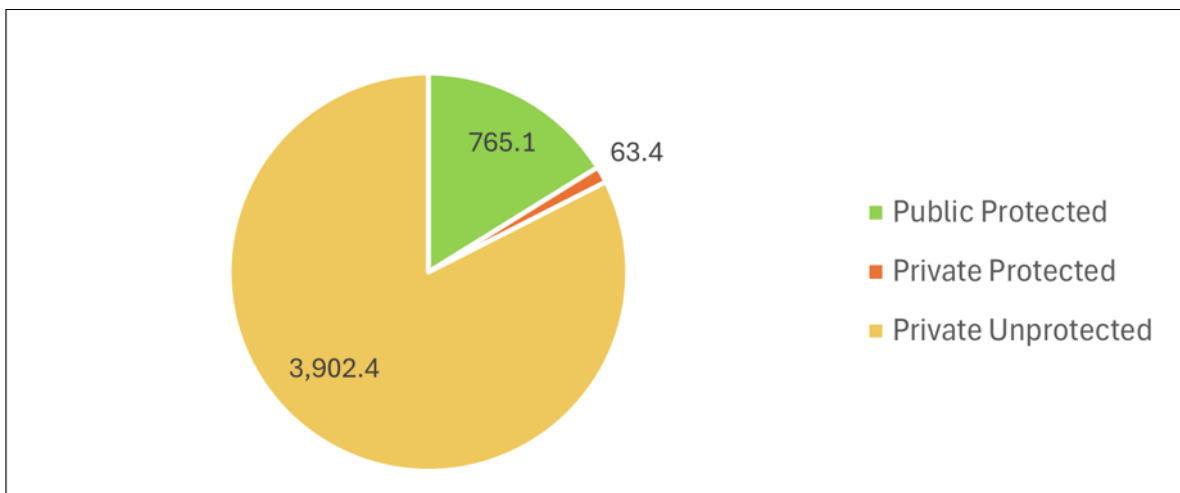


Figure 8.3 Ownership and protection status of Tennessee land bordering aquatic habitat and having high to very high combined priority (measured in river miles)

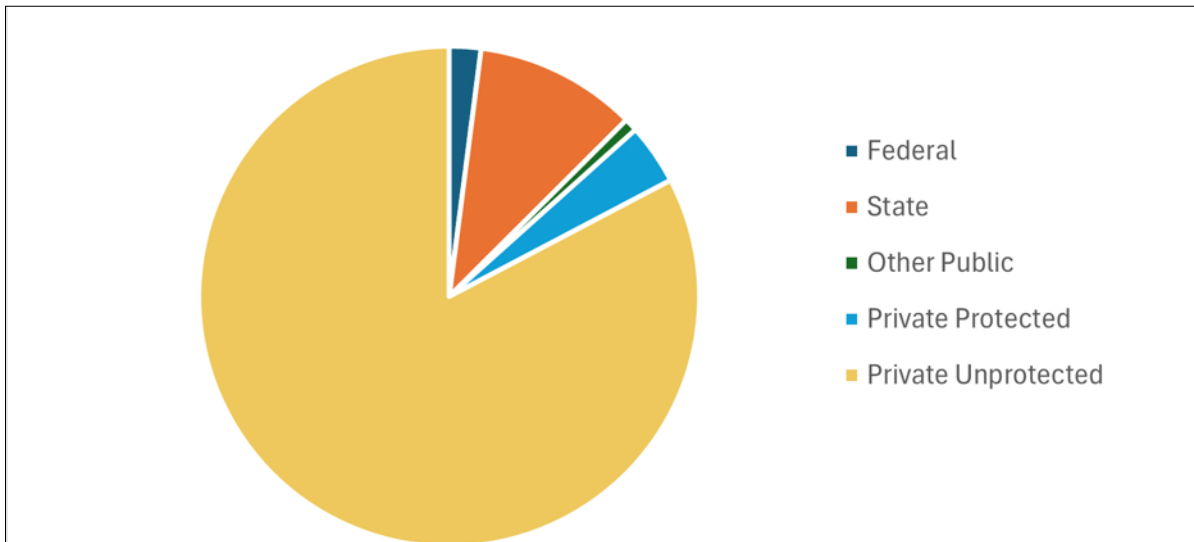


Figure 8.4 Tennessee ownership and protection status of caves
(Other public lands include railroads and utility corridors.)

Fig. 8.5 is a bar graph showing land by ecoregion, sorted by protection status and ownership. The red section of each bar shows the proportion of private, unprotected high to very high terrestrial priority land for SGCN in each ecoregion.

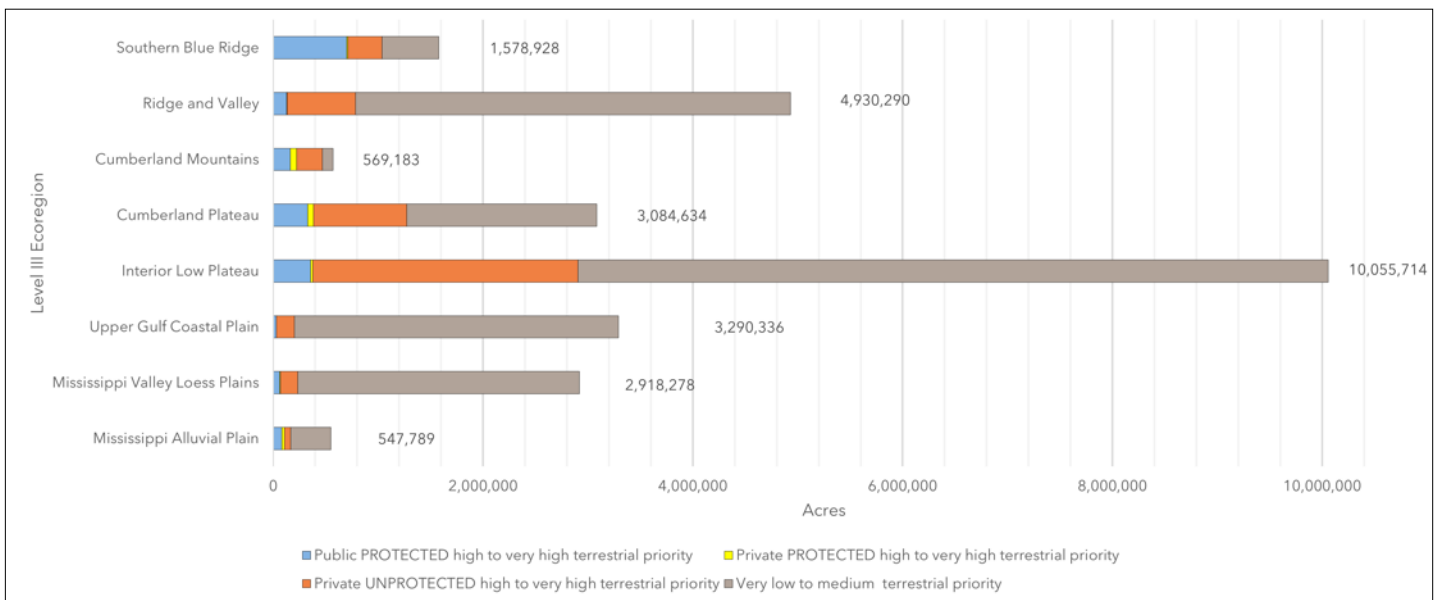


Figure 8.5 Protection status by owner and SWAP terrestrial priority within TN Level III ecoregions

8.3. Landowner Priorities Drive Conservation on Private Lands

Anyone who owns property knows that land ownership comes with an entire array of concerns. For example, the top five concerns of Tennessee Family Forest (10+ acres) owners are property taxes, keeping land intact, government regulation, trespassing/poaching, and insects/disease (USDA Forest Service 2021). Environmental concerns are the common link between private landowners and agencies, organizations, and programs seeking to achieve wildlife and plant conservation goals.

When considering programs, partners, and approaches to conservation management, landowner priorities drive the decision-making process. In developing this chapter to address Tennessee's private lands, a Landowner's Conservation Planning Guide was developed to assist landowners in identifying their key concerns and conservation priorities. The questions within this resource are designed to guide landowners in considering key aspects of their property and to inform them of the technical and financial assistance programs that may be available to them. By understanding the current state of the property, as well as any limitations it may have, one can select the range of conservation activities that may be compatible with both the land's natural properties and the landowner's objectives.

The Landowner's Conservation Planning Guide, located at the end of the chapter, helps you, the landowner, to understand four main issues by posing a series of questions that will help to clarify these issues:

- What are the natural and economic characteristics of your property?
- What are your conservation goals?
- What is your capacity for working on the land?
- Who are the potential partners that can help you reach your goals?

Landowners can address many of the concerns they have about the profitability or aesthetics of their land while also promoting healthier soil, water, and wildlife habitat. Many voluntary, non-regulatory programs exist for this purpose.

In planning for this work, you are likely to receive a property analysis from a partner or other expert, and you may find opportunities that did not originally come to mind, such as identifying that your property falls near or within a Conservation Opportunity Area (COA) as identified by the SWAP or that it contains SWAP-designated priority habitats with high conservation value. Chapter 6 within the SWAP covers conservation actions and strategies, and Appendix I contains fact sheets

Environmental concerns are the common link between private landowners and agencies, organizations, and programs seeking to achieve wildlife and plant conservation goals.

RESTORATION OF THE “HAPPY” LANDSCAPES OF TENNESSEE

Light, open, sunny, airy, breezy—these qualities describe ways of being that are universally recognized as good, even “happy.” They also describe habitats in Tennessee that were once far more abundant. These include prairies, savannas, woodlands, small-patch barrens and glades (occurring on thin soils), balds (relicts of alpine tundra), and river scours, fens, bogs, and depression ponds characterized in part by water and moist soils.

These habitats all share the characteristics of having an herbaceous layer dominated by grasses, other grass-like plants, and forbs, i.e., wildflowers (Noss 2012). However, 200 years of fire suppression have resulted in the transformation of many of these landscapes into dense, dark forests that lack the habitat diversity required by many at-risk species.

Most Tennessee forests now consist of an ~80-year-old closed canopy mix of maple, oak, pine, and hickory, but some of the most valuable trees for wildlife and the economy, such as white oak (*Quercus alba*), not to mention the wildflowers essential to pollinators, have trouble regenerating in dark closed canopy forests.

The good news is scientists and conservationists have been hard at work in recent decades to bring a happier aspect to many of Tennessee’s landscapes. Since >80% of the state’s forest is privately owned, it’s even better news that landowners are increasingly interested!

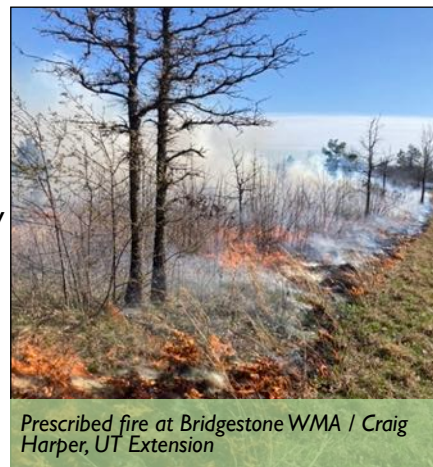


Catoosa WMA after restoration using selective thinning and prescribed fire / Clarence Coffey

WOODLANDS AND SAVANNAS

Most people, if given the opportunity to ramble through the area shown in the photo above, would be delighted. “Landowners love these types of forests and tend to see them as quite beautiful,” says **Britt Townsend**, a forester with the title **Director of Forestry at The Nature Conservancy**. “The dappled light playing over grasses and wildflowers and the diversity of species that can be seen and heard are so inviting.”

This type of forest has a more specific name: it’s a woodland. A woodland has an open structure that lets sunlight to the ground, but still has enough trees that they cast shade (30-70% tree cover). The sunlight is critical: it supports an incredibly diverse array of understory plants. The Southeastern Grasslands Institute (SGI) conservation plan for the Cumberland Plateau (Noss et al. 2025, in draft) catalogued evidence of 210 plant species of conservation concern that require this level of sunlight.



Prescribed fire at Bridgestone WMA / Craig Harper, UT Extension

Only recently have ecologists had the tools to document that large areas of the Southeast were once covered by woodlands, as well as other open ecosystems. These habitats were maintained by fire originating from lightning strikes and burning by Indigenous people, as well as disturbance by large herbivores such as elk and bison. (Noss 2012). Of the 14 million acres of forest in Tennessee, approximately nine million (64%) are considered fire-adapted (B. Townsend, pers. comm.)

“In places like the Cumberland Plateau, what you should find is a mosaic or ‘matrix’ of habitats,” says **Zach Irick**, botanist and **Southern Appalachian Grasslands Ecologist with SGI**. “There are still savannas

(sparse trees) interspersed with glades (rock outcrops) and seepage wetlands like bogs or ponds, intermixed with woodlands, but sometimes I feel like I'm working in a living museum, because those plants and animals don't have other populations to interact with. They are fragmented and isolated." This mosaic of woodland/grassland habitats was once characteristic of the Southern Appalachians, but also well into central Tennessee.

"I'm extremely passionate about woodlands and savannas because they are so dynamic and full of diversity," says Townsend. "Working with private landowners is essential if we are going to restore these ecosystems at scale." Both Townsend and Irick agree that for landowners who are interested, woodlands are a stepping stone to achieving open habitats in the right places. Irick advises a surgical approach to restoration. "Over five years, you can take out much of the midstory maples and sweetgums without an explosion of woody plants, and for woodlands you can burn every three to five years. If you keep burning it at two-year intervals, parts may even become healthy savanna." In essence, let the land decide.

This approach of working with nature characterizes much of the forest restoration work ongoing in Tennessee today. At Bridgestone Nature Reserve at Chestnut Mountain in White Co., analyses including Ecological Zone (Ecozone) classification and mapping of historic vegetation (Simon et al. 2005) have estimated that approximately 4,000 acres were historically dry oak-hickory forests and shortleaf pine (*Pinus echinata*)-oak savannas and woodlands. Since 2015, approximately 250 acres of shortleaf pine-oak woodland have been restored with another 1,000 acres currently undergoing restoration!

Restoring these open systems will help re-establish habitat for birds such as Bobwhite quail and Prairie Warbler; roosting cavities for bats and woodpeckers; and a critical food source for birds, mammals, and hundreds of pollinator species, such as the once common, now at-risk, American Bumblebee (*Bombus pensylvanicus*). Yes, wildlife need the trees—but the species of animals and plants in decline actually need sun in the understory more.

Likewise, at the "the Grand Canyon of southeast Tennessee," the Tennessee River Gorge Trust has completed midstory canopy clearing, a burn plan, and fire breaks under Irick's tutelage in preparation for restoring a unique savanna/woodland/marsh complex at Aetna Mountain Bogs. "This kind of restoration is achievable by a lot of people to restore imperiled grassland communities," says Irick. Happily, more and more projects of this type are occurring on the landscape. Irick believes the critical factor is that we can no longer think on one- to five-year timelines. "We have to think on hundreds-of-years timelines." The modern cycle of quarterly reports and 3-year grant cycles will not cut it. "It's a long-term commitment to being part of the landscape that you want."

Partners for TN Grassland/Woodland/ Open Pine Restoration & Conservation (not a complete list)

The Nature Conservancy in Tennessee (TNC)
Quail Forever
Ruffed Grouse Society / American Woodcock Society (RGS & AWS)
Shortleaf Pine Initiative
Southeastern Grasslands Institute (SGI)
Tennessee Forestry Association
Tennessee River Gorge Trust
Tennessee Wildlife Resources Agency (TWRA)
USDA Forest Service (Cherokee NF)
UT Extension
White Oak Initiative



Native warm season grasses and wildflowers flourish in a shortleaf pine savanna / Britt Townsend, TNC



Before and after forest treatments to restore shortleaf pine and oak savannas at the Bridgestone Nature Reserve at Chestnut Mountain / Britt Townsend, TNC

Noss, Reed. 2012. *Forgotten Grasslands of the South: Natural History and Conservation*.

Noss, R.F., D. Estes, T. Witsell, E. Bohnett, S. Simon, C. Morgan, K. Elliott, C. Thomas-Hill, and L. Dunlap. 2025. *Comprehensive Status Assessment and Conservation Plan for the Grasslands, Savannas, and Other Open Ecosystems of the Cumberland Plateau*. Southeastern Grasslands Institute, Austin Peay State University, Clarksville, TN (in draft).

Simon, S.A., T.K. Collins, G.L. Kauffman, W.H. McNab, and C.J. Ulrey. 2005. *Ecological Zones in the Southern Appalachians: first approximation*. Res. Pap. SRS-41, Asheville, NC: US Department of Agriculture, Forest Service, Southern Research Station

that may provide landowners with insights to guide the enhancement of natural habitats found on site or suggestions for suitable habitat restoration projects.

Landowners can address many of the concerns they have about the profitability or aesthetics of their land while also promoting healthier soil, water, and wildlife habitat.

In addition, if you choose to seek funding or other support for your project, it may provide leverage to note in your application that your project site lies within a COA, as your actions may contribute directly to prioritized goals within the COA.

Even if one's property lies outside the boundaries of a state COA, there may be high priority habitat to manage or to restore.

Landowners have a unique and valuable responsibility for the direction and quality of their conservation efforts. For example, one property could potentially support:

- A prairie meadow restoration that promotes habitat for pollinators and birds
- A wetland enhancement aimed at improving stormwater runoff filtration and wildlife habitat
- Development of a transitional "soft" forest edge habitat to support an increase in bird diversity
- An assortment of small-scale improvements that incorporate otherwise limited or absent wildlife habitat support.

Landowners are commonly faced with environmental challenges that require creative solutions. Oftentimes, there are financial incentives and assistance programs to make such solutions more feasible; more details on this can be found in Section 5, Sources of Support for Private Land Conservation.

8.4. Environmental Concerns of Landowners in Tennessee

The top environmental concerns expressed by private landowners in Tennessee are described below.

8.4.1 Erosion

Erosion includes wind, gully, and stream or lake bank erosion. These forms of erosion are most commonly addressed through livestock exclusion, cover crops, bank stabilization, no-till agricultural methods, and vegetated buffer development. Offsite transport of sediment to surface water degrades water quality and limits its use for a variety of purposes, including drinking water and aquatic species habitat.

8.4.2 Water Resources

Water resources include both water quality and supply. Water quality can be affected by nutrients, sediments, pesticides, pathogens, heavy metals, and other chemicals. Water quality can be

improved through a variety of practices that are primarily aimed at decreasing or slowing runoff into surface waters. Depending on the source of pollution, such practices may include plans for how to reduce chemical use or improve the storage of nutrients, as well as pollution mitigation buffers that slow, filter, and reduce the level runoff flowing into surface waters (see below for a discussion of groundwater). Such practices include riparian buffers and edge-of-field practices. Water supply can be impacted by surface or groundwater depletion, and overuse of water for irrigation and other purposes, as well as prolonged drought (due to climate change or other factors). These issues can be managed by adapting withdrawal rates to the level of supply, improving soil conditions (to allow greater infiltration of precipitation into groundwater), improving irrigation efficiency.

8.4.3. Groundwater

Groundwater is a source of both drinking and irrigation water in Tennessee. Its protection is critical because karst (limestone) habitat in Tennessee exceeds that of any other state except Kentucky (Siska 2008). Karst is a diverse, complex landform characterized by soluble rocks, poor surface drainage, well-developed subsurface drainage, caves, disappearing streams, and an abundance of springs and well-defined depressions. In the Western Highland Rim of Tennessee and Kentucky, rates of urban development in karst are among the highest in the southeastern United States (Siska 2008).



Karst at Jackson Cave, TN / Kyle Hartshorn

Karst-dominated landscapes where underground aquifers are closely connected to surface activities are particularly susceptible to water quality problems due to the direct and often short connections between surface water and groundwater. Protecting groundwater is critical because contaminants like fertilizers, pesticides, animal waste, and petroleum products can easily enter and spread through these underground systems. Karst buffers are lands that are left undeveloped and/or improved to serve as protection from adjacent land uses. In karst landscapes, buffers can be used around sinkholes and sinking streams (surface streams that disappear underground) to minimize polluted runoff entering directly into the groundwater system ("1.2 Karst Landscapes," [date unknown]).

Landowners can help protect groundwater by:

- Establishing and maintaining vegetated buffers around sinkholes, springs, and ephemeral streams to slow runoff and filter pollutants

- Properly storing and disposing of hazardous materials like fuels, chemicals, and fertilizers
- Fencing livestock away from sinkholes and cave entrances to prevent waste from entering groundwater systems
- Using nutrient and pesticide application best practices (e.g., following soil tests, avoiding overuse, and avoiding application before heavy rain)

In karst areas, landowners are strongly encouraged to avoid development or heavy disturbance near sinkholes, sinking streams, or exposed limestone features. These features act as direct conduits into the aquifer system, and programs like EQIP may offer cost-share support for implementing protective buffers or fencing.

8.4.4. Pollinator/Wildlife Habitat

Pollinator/wildlife habitat is terrestrial habitat for wildlife and invertebrates that provides sufficient quantity, quality, or connectivity of food, cover, space, and/or water to meet species requirements. Options for improving habitat quantity and quality depend upon the type of land and the target species of concern (e.g. native bees, butterflies, birds, honeybees).



Common Eastern Bumblebee (*Bombus impatiens*) / Preston 0518 via iNaturalist

8.4.5. Forest Management

Forest management is critical to prevent or respond to excessive pest damage to trees and understory plants, which may occur from undesired plants (competition), diseases, animals, soil borne pathogens, and nematodes. Technical assistance can assist landowners to promote healthy forests and to address invasive plant, animal, and insect species, while forest management plans allow landowners to be proactive in preventing problems from developing.

8.4.6. Wildfire Hazard from Biomass Accumulation

Wildfire hazard from biomass accumulation is a problem that is becoming more widespread through the combined effects of climate change, human settlement in the wildland-urban interface, and insufficient or improper forest management. Hazards posed may threaten human safety, structures, plants, animals, and air quality. Programs to assist landowners with prescribed burns and other measures help to limit surface and ladder fuels while providing a defensible space around structures. To reduce wildfire risks, landowners can request assistance from **TDF** for prescribed burn planning or connect with their local **Fire Adapted Communities** network to explore equipment loans, training, or community fuel mitigation projects.

8.4.7. Plant Productivity and Health

Plant productivity and health are of prime concern to those who raise plants for a living. Improper fertility, management, or plants that are not adapted to a site all negatively impact plant productivity, vigor, and/or quality. Plants are also a critical element of wildlife habitat, and some native plant species are conservation targets. For these reasons, a variety of programs are available to landowners to improve plant productivity and health, which vary depending on land use (crops, forest, range, pasture).

8.5. Sources of Support for Private Land Conservation

Voluntary, non-regulatory programs exist at virtually all levels of government to help landowners achieve conservation goals for their properties, and these are supplemented by many programs operated by nonprofit conservation organizations. Support may come in the form of free technical assistance, management planning, or financial support for a wide variety of conservation activities.

Private land conservation, in general, can be divided into two primary categories: stewardship and protection. Stewardship is a term that encompasses all of the land management activities that can or must be undertaken to maintain healthy soils, wildlife, and plant populations (which more often than not tend to also support healthy economic returns for the landowner.) Such management activities vary by land use and natural system. For example, regular prescribed fire in a pine or mixed pine/oak forest is one of the best and most cost-effective ways to promote plant and wildlife diversity, as well as maintain the health of the trees. On the other hand, in riparian zones along rivers from west to east Tennessee, proper management of cattle may include fencing, gates, fords, and management systems that protect the riparian vegetation and all wildlife dependent upon it, as well as the health of the cows. (See Box 8.1 and Brawley's Fork Crayfish example).

Protection is generally used to refer to measures that will provide some level of improved management and/or protected status to land in perpetuity. It refers to acquisition of certain rights to land, which can run the gamut from 100% fee-title ownership (such as when private land is sold to a state government for addition to a park) to a conservation easement that permanently restricts new construction or limits certain land uses. It is critical to note that protection does not always mean "selling the farm!" Conservation easements, in particular, are quite variable and flexible, and can be defined depending on the needs of the landowner. (See easement discussion in 8.5.2.)

Sources of support for stewardship and protection are generally as distinctly different as the activities themselves; a summary of each follows.

8.5.1. Private Land Stewardship

Technical assistance and financial support

In accessing voluntary, nonregulatory sources of support for land stewardship, the key is for landowners to match their needs and goals with the appropriate program that shares their goals. In fact, it is common for landowners to work with biologists (variously titled "habitat," "private

lands,” or “wildlife” biologists) to develop a conservation plan that will, over time, make use of multiple programs established for different purposes.

Federal programs to support private land stewardship and technical assistance are needed for numerous reasons. Landowners can incur expenses associated with wildlife use including damaged crops and fences, reduced livestock forage, potential for disease transmission, and adjustments to business operations to account for wildlife use. Pressures to develop and subdivide are a significant challenge for conservation of privately-owned lands. Also, when important wildlife habitats such as migration corridors are documented on private lands, landowners have expressed concern over the potential for increased regulations and restrictions on their land.



No till planting / United Soybean Board

In addition, good stewardship provides public benefits, such as clean water, clean air, and healthy soil. Aldo Leopold, the father of modern wildlife ecology, recognized this when he wrote in 1934 that “the thing to be encouraged is the use of private land in such a way as to combine the public and the private interest to the greatest degree possible.” That means finding ways of “rewarding the private landowner who conserves the public interest.”(Leopold 1953).

Private landowners who wish to prioritize biodiversity/wildlife conservation goals on their property also have the opportunity to partner with agencies and organizations in additional ways, including:

- Collaborating on research, monitoring, and species reintroductions on their property
- Providing proprietary information about species occurrences and habitat conditions on private land
- Creating opportunities for field tours and training to occur on their property.

The following section describes some of the largest and most successful private lands conservation programs in Tennessee, but it is by no means an exhaustive list.

State programs

The Tennessee Wildlife Resources Agency (TWRA) provides technical assistance and development of management plans free of charge; this service does not need to be linked to participating in a formal conservation program. TWRA, through a partnership with (United States Department of Agriculture’s Natural Resources Conservation Service (USDA NRCS), has helped to establish tens of thousands of acres of wildlife habitat in Tennessee through its Wildlife Habitat Biologist and Partner’s positions. The majority of habitat programs and funding are from Farm Bill programs administered through the USDA system. To be most effective, TWRA Wildlife Habitat Biologists and

ARTIFICIAL ROOSTS FOR INDIANA BATS

Indiana Bats (*Myotis sodalis*) have been in decline for decades and were one of the first mammals to be listed as endangered predating the 1973 Endangered Species Act. As with many difficult-to-solve problems, the reasons for this decline are numerous and complex.

Habitat changes since European settlement have affected both their foraging habitat and their maternity roosts. Adapted to hunt for insects in forests where the understory was kept relatively open via the action of fire and bison, these conditions have become limited as fire and bison have disappeared from the landscape. In addition, female Indiana Bats are very selective about the trees they use as maternity roosts. They require dead trees with sloughing bark and high solar exposure.

This bat species seeks out very cold, dry conditions in winter. While they are susceptible to white-nose syndrome (WNS), they are often able to clear these infections rapidly after arousing from winter torpor—the issue is surviving through the winter with WNS. Human disturbance in winter, compounded by WNS, is also a major threat to the species.

Given the long-term decline of Indiana Bats and the relatively recent advent of WNS, biologists began asking what might be limiting their reproduction? That is how several projects conducted from 2009 to the present led, not only to the discovery of new maternity sites, but also to the use of artificial maternity roosts!



Hibernating Indiana Bats /
Dustin Thames, TWRA

MIGRATION TELEMETRY AND REGIONAL COLLABORATION

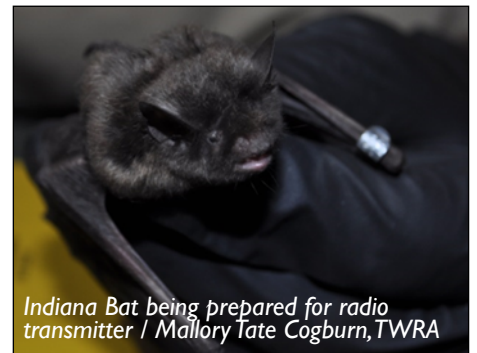
In 2009, TWRA began a 10-year Indiana Bat aerial telemetry project in collaboration with Copperhead Consulting, the US Fish and Wildlife Service, and others. Bats were removed from their hibernacula when they would have naturally migrated, received tiny transmitters glued to their backs, and released. Then began a chase through woods and fields as biologists

sought to track bat transmitter signals from small planes and vehicles equipped with telemetry receivers and antennas. (The life of each transmitter is only about 21 days). Researchers needed to follow the female bats to find out exactly where they were going to give birth and raise their pups.

This project led to some major discoveries. Several Indiana Bat maternity roosts with up to 74 individuals each were discovered in Wilson County, Tennessee in 2013. For the first time, Indiana Bat maternity roosts were also discovered in Georgia, west Tennessee, and Alabama. An Indiana Bat was also tracked to Mississippi, but the roost location could not be found. These states began including Indiana Bats in their conservation planning.

Subsequent to their discovery in Alabama, TWRA reached out and began working with researchers from Talladega National Forest to help them monitor the Indiana bat populations newly found in their district.

“Our suspicions that Indiana Bats were present on the Talladega were confirmed from 2011 to 2019 when females coming from caves in Tennessee and Alabama were tracked to one of the largest Alabama forests managed with prescribed fire,” says **Jonathan Stober, District**



Indiana Bat being prepared for radio
transmitter / Mallory Tate Cogburn, TWRA

Biologist on the Shoal Creek Ranger District. “The Shoal Creek is also home to a Red-cockaded Woodpecker recovery population. With the overlap of these two endangered species, we began capturing and tagging Indiana Bats to look at habitat and roost selection. We found the bats selected habitats that had been managed with prescribed fire as a primary tool, due to the abundance of snags and insects.”

PRIVATE LAND PARTNERSHIPS BENEFIT BAT PUPS

The telemetry project revealed the location of key maternity roosts in Tennessee, and they were all in dead trees on private property. TWRA biologists decided to test the use of artificial roost sites for maternity colonies by developing special agreements with landowners. With a grant from TVA, they completed the first license agreement with a private landowner in 2019. TWRA leases the landowner’s property (in this case, 850 acres) for a nominal annual fee for 10 years, and in return they are allowed to install artificial roosts and to access them for monitoring and research. The research goal was to determine if the bats would use artificial roosts and, if so, what kind.

Natural maternity roosts are limiting because Indiana Bats will only use the same tree to raise their pups for one to two years. The optimal window for Indiana Bat roosting in a dead or dying tree is relatively small. In the Midwest, Indiana Bats have responded positively to a type of roosting structure called a rocket box, which allows bats to partition their roosting by temperature within the box.

In 2019, TWRA installed and began monitoring nine rocket boxes and 15 artificial roosts made from “Branden Bark”—a synthetic product that mimics the structure of shaggy tree bark. Emergence counts demonstrated that by 2020, Indiana Bats were successfully using Branden Bark for maternity roosting (to the exclusion of rocket boxes)! This has continued, and by 2024, the bats had selected the same artificial roosts for five consecutive years.



A natural Indiana Bat maternity roost in a dead American Elm / Dustin Thames, TWRA

“If you build it they will come,” this is how **Dustin Thames, Regional Biodiversity Coordinator** for TWRA and member of the Tennessee Bat Working Group, describes this project. “The roosts help not only because sites are limiting, but also they help female bats eliminate their expenditure of energy while flying around in spring looking for the perfect tree.” In 2022-23, a TWRA student technician monitored the artificial roosts, conducting weekly emergence counts and looking for evidence that the roosts may be getting too hot. So far, the artificial roosts do not appear to be overheating. In 2022 TWRA completed their second private land

license for installation of Indiana Bat maternity roosts. Ultimately, conservation partners want to purchase property in Wilson County near the roosts for protection in perpetuity and to manage it specifically for Indiana Bats with open forests and artificial roosts.



Installing Branden Bark by Dustin Thames, TWRA

Installation of an artificial maternity roost requires heavy equipment.

Indiana Bat Conservation Partners

Indiana Bat Telemetry (2009-2019)

Talladega National Forest, Alabama, USDA Forest Service

Tennessee Valley Authority (TVA)

Tennessee Wildlife Resources Agency (TWRA)

The Nature Conservancy

US Fish and Wildlife Service (USFWS)

University of Tennessee, Knoxville

Artificial Maternity Roosts (beginning in 2019)

Copperhead Environmental Consulting, Inc.

Tennessee Valley Authority

Tennessee Wildlife Resources Agency

Private landowners who have willingly provided access to their properties



Netting Branden Bark roosts / Dustin Thames, TWRA

Mist netting to capture bats emerging from Branden Bark structures. Some bats from each roost are tagged and tracked to determine site fidelity and movement between sites.

most Quail Forever Farm Bill Biologists (sometimes collectively referred to as “Farm Bill Biologists”) are housed within USDA NRCS offices.

For landowners or producers with a serious interest in wildlife habitat enhancement, technical assistance from a TWRA or conservation partner biologist is recommended. Technical assistance and development of management plans are provided free of charge and do not need to be linked to participating in a formal conservation program.

TWRA private lands programs include:

- The **Tennessee Riparian Incentives Program** (TRIP) assists cities, schools, community organizations, civic groups, watershed organizations, conservation groups, and other relevant organizations with riparian (streamside) tree planting projects.
- Quail Focal Areas in Tennessee, in which TWRA has designated five of its wildlife management areas (WMAs) across the state to serve as anchors within a quail focal area. Landowners interested in improving their lands for quail should contact their local **TWRA or Quail Forever Habitat Biologist**.

The Tennessee Department of Agriculture-Tennessee Division of Forestry (TDF) operates the My Tennessee Woods program for private forest landowners. The overarching goal of TDF programs is to maintain and improve the health of urban and rural forests and related economies, as well as to protect the forests and citizens of the state. Landowners can contact their Tennessee Division of Forestry (TDF) Area Forester for free, personalized forest management advice, including help with developing a Forest Stewardship Plan or identifying cost-share opportunities. These plans help guide decisions about harvesting, wildlife habitat, invasive species control, and more. Visit **My Tennessee Woods** for more information.

TDF’s Forest Stewardship Program aims to maximize cost effectiveness through the use of partnerships in program delivery and increase forestland value and sustainability, a goal that is becoming more urgent. Tennessee’s forest industry relies on 14 million acres of forestland in the state, approximately 83 percent of which is privately owned. However, as Tennessee’s population grows and shifts toward urban centers, an increasing number of forest landowners are out-of-state, absentee, are not focused on long-term forest health and sustainability, and/or don’t have the experience and expertise needed to manage their forest resource.

The Division assists landowners in achieving forest resource conservation and management objectives on their land, engaging an average of 20,000 citizens per year and providing forest planning for an



Logs after harvest / Greg Lobinski

average of 62,000 acres per year. Specifically, financial assistance is available through the **Tennessee Agricultural Enhancement Program** and the **Southern Pine Beetle Cost Share for Landowners**. TDF's professional foresters provide technical advice, and the following vendor services can be supplied when unavailable through the private sector:

- Prescribed burning
- Timber marking
- Firebreak installation
- Tree planting

TDF's **East Tennessee Nursery** is an excellent resource for tree seedlings. Located in Polk County, the nursery grows and distributes over 3 million seedlings each year. Small nursery stock (usually one-year-old or younger) typically transplants more successfully and is more likely to survive than larger, older trees and shrubs. Using seedlings is also cost-effective and allows one to undertake reforestation projects on a greater scale.

A variety of guidance materials in support of private non-industrial forest landowners can be found on TDF's My Tennessee Woods Forest Landowner Resources page. Additional state support of private lands stewardship, education, and forestry projects, including financial assistance, are available through the Tennessee Department of Agriculture.

Federal programs

Federal programs are often national in scope and tend to focus resources on the issues that are most prevalent in each state.

The Natural Resources Conservation Service (NRCS) provides support for private lands conservation through a variety of programs. The following are the primary programs that provide technical assistance and financial support for land management. NRCS programs that support land protection through easements are covered in 8.5.2.

- **Conservation Planning** (or **Conservation Technical Assistance, CTA**) provides the nation's farmers, ranchers and forestland owners with the knowledge and tools they need to conserve, maintain and restore the natural resources on their land and improve the health of their operations for the future. NRCS offers this assistance at no cost to producers. The goal is to give landowners personalized advice and information, based on the latest science and research, to help them make informed decisions.
- The **Environmental Quality Incentives Program (EQIP)** provides technical and financial assistance to agricultural producers and forest landowners to address natural resource concerns, such as:
 - Improved water and air quality
 - Conserved ground and surface water
 - Increased soil health

- Reduced soil erosion and sedimentation
- Improved or created wildlife habitat
- Mitigation against drought and increasing weather volatility.

EQIP helps producers make conservation work for them. Financial assistance for practices may be available through EQIP. Some producers may also qualify for advance payment.



The Cumberland Dusky Salamander / Chris Simpson, TWRA

- The **Conservation Stewardship Program (CSP)** helps landowners build on existing conservation efforts while strengthening their operations. CSP offers annual payments for implementing additional practices on land while operating and maintaining existing conservation efforts. The program represents a genuine commitment to conservation – CSP contracts are for five years, with the opportunity to compete for a contract renewal if the landowner successfully fulfills the initial contract and agrees to achieve additional conservation objectives. CSP can help landowners who are already taking steps to improve the condition of their land to find new ways to meet their goals. NRCS works one-on-one with producers to develop a conservation plan that outlines and enhances existing efforts, using new conservation practices or activities, based on management objectives for the operation. Producers implement practices and activities in their conservation plan that expand on the benefits of cleaner water and air, healthier soil, and better wildlife habitat—all while improving their agricultural operations. For example, after experience planting a cover crop, landowners may decide to try an enhancement for a multi-species cover crop or implement a deep-rooted cover crop to break up soil compaction and further improve the health of their soil.
- The **Regional Conservation Partnership Program**, first authorized by Congress in 2014, is a partner-driven approach to conservation that funds solutions to natural resource challenges on agricultural land. RCPP projects may include a range of on-the-ground conservation activities implemented by farmers, ranchers and forest landowners. These activities include:
 - Land management/land improvement/restoration practices
 - Land rentals
 - Entity-held easements
 - United States-held easements
 - Public works/watersheds

Half of RCPP funding focuses on critical conservation areas designated by the Secretary of Agriculture and half is available as single or multi-state funding pools. RCPP funding is of two types: (1) funding that supports producers via traditional NRCS programs (listed above) and

easements, working in collaboration with partners or (2) RCPPs in which NRCS supplies funding directly to partners for use on eligible lands.

In 2024, the USDA announced a historic \$1.5 billion for 92 partner-driven RCPP projects, with partners providing \$968 million in contributions to amplify the impact of the federal investment. For example, one RCPP project in Tennessee will improve water and soil quality by establishing diverse habitats on the edges of production sites across six counties, supporting ecosystem services that reduce synthetic inputs.

USFWS - Partners for Fish and Wildlife (PFW) is a voluntary, non-regulatory program of the US Fish and Wildlife Service offered to private landowners, managers, tribes, corporations, schools, and non-profits interested in improving wildlife habitat on their land. The Program supports the recovery of federally listed species and the conservation of at-risk species.

Projects are custom-designed to meet landowners' needs, balancing the need for a working landscape with conservation priorities. Landowners must be willing to enter into a minimum 10-year agreement with the Service, at least one Federal Trust Resource must benefit, and the landowner's management objectives must align with the Service's. (Federal trust resources are the fish and wildlife resources managed by the USFWS and other agencies as a public trust for people today and for future generations. The public is considered the owner of these resources, which the government protects and maintains.) Projects are selected subject to ranking factors that are developed at the national, regional, and local levels. Individuals interested in participation are asked to work with their local contacts to develop a proposal that meets shared priorities.

In Tennessee, PFW tends to work with landowners and partner organizations seeking to control erosion associated with livestock production, restore fish passage and improve aquatic habitat connectivity, and manage upland sites for game and non-game species. The latter often includes



A severe barrier situation was addressed by replacing a culvert with a concrete bridge and box to allow more water to flow through the culvert in a more natural way / Robby Cogburn, Partners for Fish and Wildlife, USFWS



TWRA Fish Biologist Sally Petre explains that the wider bridge compared to the old narrow culvert it replaced allows more water flow, which is good for the fish and reduces flooding. — formerly a common occurrence / WLAF News

PFW Program has terrestrial focal areas within the state; aquatic priorities of the US Fish and Wildlife Service (represented by Strategic Habitat Units) serve as aquatic focal areas. Private lands play a critical role in addressing threats to aquatic ecosystems, which include sedimentation, non-point source pollution, loss of riparian habitat, and other factors leading to unstable stream banks.

Example: Partners for Fish and Wildlife, a win/win for county and threatened fish

USFWS, TWRA, and Campbell County Highway Dept. Partnered to build two new bridges across Coontail Branch in the Elk Valley. The project included improved “bottomless” culverts to allow the passage of tiny aquatic species, most notably the federally threatened Blackside Dace and the Arrow Darter, state listed as threatened. The new bridges were paid for with \$211,000 in federal funds (PFW), with in-kind match provided by the road department.

Example: Improving the health of cattle and Brawleys Fork Crayfish population

PFW partnered with a private landowner, Tennessee Department of Agriculture, Natural Resource



Before Restoration: Livestock Winter Feeding 2020-2021 / Dustin Boles, Partners for Fish and Wildlife, USFWS



Two new heavy-use area concrete feeding pads, cross fencing, alternative water sources, and an access road allow the landowner to rotate his cattle more efficiently throughout the year. With feeding pads on either side of the creek, the landowner can move his herd across a stabilized creek crossing. /Lauren Neale, TN Cattleman's Association

Conservation Service, Cumberland and Cannon County Soil Conservation Districts to deliver a project targeting improvements to aquatic habitat to benefit the Brawleys Fork Crayfish (*Cambarus williamsi*). Winter livestock feeding presented challenges for the landowner, including weather patterns, short days, and sometimes sick cattle. Winter feeding also impacted the stream that flows through the farm. Together, the conservation partners devised a strategy to address the landowner's working lands management needs while also producing species outcomes. To achieve these mutual goals, the Service provided cost-share to the landowner to relocate his winter feeding operation away from the creek, allowing nutrients and sediment to filter.

The **Family Forest Carbon Program** (FFCP) was developed in 2024 as a collaboration between the American Forest Foundation and The Nature Conservancy, two national conservation nonprofits. FFCP pays family landowners to implement practices on their forestland that promote carbon storage and sequestration. The minimum acreage needed to enroll is low –only 30 acres,

Example: Managing Limestone Cedar Glades on private lands

PFW works with partners at Southeastern Grasslands Institute, Quail Forever, Tennessee Department of Environment and Conservation State Natural Areas (TDEC SNA), NRCS, and TWRA to collaboratively develop projects with landowners that meet both land management and species conservation objectives in Tennessee's Central Basin. The area is a hotspot for plant and animal diversity that is adapted to the basin's assortment of interwoven karst habitats, ranging from caves, springs, and sinkholes to limestone glades and barrens.



Federally endangered leafy prairie clover (*Dalea foliosa*) / Robby Cogburn, Partners for Fish and Wildlife, USFWS



Forestry mulcher clearing encroaching eastern red cedar and other undesirable vegetation / Cooper Breeden, SGI



- Implementing prescribed fire / Credit Sam King, TDEC, SNA



Site following eastern red cedar removal and prescribed fire / Dustin Boles, Partners for Fish and Wildlife, USFWS

Nonprofit conservation programs

The Tennessee Wildlife Federation's **Habitat Restoration Program** partners with private landowners and public agencies to restore and conserve habitat in four major habitat types in Tennessee: wetlands, grasslands, forests, and streams. The program also leverages the Federation's expertise and connections to facilitate the acquisition of critical lands and to improve access to Tennessee's most prized public lands.

compared to 3,000+ acres that many other programs require. On top of that, FFCP provides technical assistance and forest management education to help landowners create healthy forests aligned with their personal goals. As of 2025, FFCP is available in Alabama, Kentucky, Ohio, Pennsylvania, Tennessee, West Virginia, and western Maryland. In less than two years, FFCP has enrolled over 70 Tennessee landowners and more than 15,100 forested acres. Across the seven participating states, the program has partnered with nearly 1,200 landowners to protect and responsibly manage over 165,000 acres of forested land.

8.5.2. Private Land Protection

Protecting the natural state and ecological value of private property can bring a landowner many benefits. One gratifying outcome is knowing that present and future generations will enjoy the property's natural beauty and value. There can also be substantial tax advantages for current landowners and their heirs. (TNC)

For private landowners interested in voluntary conservation of their land in perpetuity, this generally means a choice between:

- a. Protecting land while transferring title to their property, or
- b. Protecting land while retaining title via conservation easement(s), retained life estate, or other legal mechanism.

Often, a landowner's objective is to dispose of his or her real estate. Land trusts are private, nonprofit organizations that generally specialize in acquiring interests in real estate for the purpose of meeting conservation goals. Land trusts across the country work in their communities to conserve habitat for wildlife and plants, secure water quality, ensure land is available for future generations, provide equitable access to nature, protect family farms and ranches, tackle climate change, build healthy communities, and more ("About Land Trusts," 2024).

Alternatively, a landowner may choose to retain all property rights except those specifically relinquished or restricted by a conservation easement. Conservation easements are voluntary, permanent, and legally binding agreements that are incorporated into the property deed. This means the easement is tied to the land itself, not to any one landowner. Whether the property is sold, inherited, or transferred to another private landowner or even to a public agency, the easement and its conservation restrictions remain in effect. Future owners of the property are bound by the same terms, and the organization holding the easement has the legal responsibility to monitor and enforce those terms forever. While landowners retain ownership and many traditional rights (such as farming, forestry, hunting, or recreation, depending on the easement language), the conservation commitments cannot be removed or ignored by subsequent owners.

Conservation easements are designed to forever protect important natural resources from detrimental land practices by donating or selling those rights to a qualified nonprofit organization (land trust) or government agency. The conservation easement holder then has the right and

responsibility to enforce the terms of the easement. Every conservation easement is unique, specifically tailored to the particular land being protected as well as to the unique circumstances of the landowner(s).

Land protection via nonprofit land trusts

The **Land Trust Alliance** (LTA), the national leader for land trust policies and standards, is a good source of information about the land trusts operating in each state. Landowners wishing to protect their land through fee title transfer or through easements or other tools can seek help from a land trust to explore a range of options and possible sources of funding, assist in determining their conservation interests, and provide general information on legal and tax issues. It is essential, however, that landowners also obtain their own independent and professional legal, tax, and financial advice. It is advisable to seek a land trust accredited by the LTA to ensure that the organization has adopted best practices pursuant to legal and IRS regulations.

For a successful partnership, land trusts and landowners must generally share conservation goals. For example, TennGreen’s strategic land conservation plan uses the State Wildlife Action Plan to prioritize landscapes of interest. Therefore, landowners who own property within Conservation Opportunity Areas may find common ground with them.

There are numerous land trusts engaged in land protection across the state. A compilation of those most active in conserving wildlife and habitat across Tennessee is provided in the Private Lands Resources (Table 8.4) at the end of this chapter.

Federal easement programs in Tennessee

The NRCS **Agricultural Conservation Easement Program** (ACEP) helps landowners, land trusts, and other entities protect, restore, and enhance wetlands or protect working farms and ranches through conservation easements.

Box 8.1 Conservation Easements: What Stays the Same / What Changes

What Stays the Same

- You still own the land – it remains private property.
- You can sell it, lease it, or pass it on to heirs.
- You can typically continue farming, forestry, hunting, recreation, and other traditional uses, as long as they are compatible with conservation goals.
- You can continue to enjoy the land’s natural beauty and use it as a family legacy.

What Changes

- Certain activities are restricted (such as subdivision, industrial or commercial development, or surface mining) depending on the terms of the easement.
- The easement becomes part of the deed, meaning the restrictions apply to all future landowners.
- The land trust or agency holding the easement will conduct annual monitoring visits to ensure the conservation agreement is upheld.
- Some activities (like new structures or timber harvests) may require advance notice or approval from the easement holder.

ACEP protects the agricultural viability and related conservation values of eligible land by (a) limiting nonagricultural uses that negatively affect agricultural uses and conservation values, (b) protecting grazing uses and related conservation values by restoring or conserving eligible grazing land, and (c) protecting and restoring and enhancing wetlands on eligible land.

ACEP has two components:

- **Agricultural Land Easements** (ALE) help private and tribal landowners, land trusts, and other entities such as state and local governments protect croplands and grasslands on working farms and ranches by limiting non-agricultural uses of the land through conservation easements.
- **Wetland Reserve Easements** (WRE) help private and tribal landowners protect, restore and enhance wetlands that have been previously degraded due to agricultural uses. A subset of this program is the **Wetland Reserve Enhancement Partnership** (WREP), which leverages resources with local partners to carry out high priority wetland protection, restoration, and enhancement; improve wildlife habitat; and mitigate climate change on agricultural lands.

The **NRCS Healthy Forests Reserve Program** helps landowners, land trusts, and other entities protect, restore, and enhance wetlands or protect working farms and ranches through conservation easements. This program provides landowners with 10-year restoration agreements and 30-year or permanent easements for specific conservation actions. American Indian tribes have an additional enrollment option of a 30-year restoration agreement.

The **Tennessee Forest Legacy Program** identifies and permanently protects environmentally important private forestlands that are threatened by conversion to non-forest uses. This is a USDA Forest Service Program, authorized by the Farm Bill, which works to identify and maintain well-managed, working forests on the landscape through grants to the states. Tennessee manages and decides on the tracts to be protected under the Legacy Program. Each tract must have a detailed forest management plan, known as a Forest Stewardship Plan. The Program currently conserves 53,315 acres across Tennessee and is growing. Over half of the \$59 million land value (\$32.9 million) was funded with Forest Legacy grants with the balance being private, non-federal matching lands and funds.



NRCS easement boundary sign /
Beverly Moseley, NRCS

Benefits of conservation easements

Restricting the uses of a property such as through a conservation easement may lead to a reduced tax assessment for that property, depending upon the county. Tax assessments are based on the property's value as determined by a local assessor. In addition, potential federal and estate tax benefits may result when donating easements. The federal income tax benefits of donating a

properly structured conservation easement were increased by Congress in 2015 to encourage more taxpayers to use this effective land protection tool. The law now allows a landowner to take a deduction for the value of the donated easement up to 50% of their AGI for the year of the donation (100% for farmers). If a deduction amount exceeds these limits, the balance of the deduction may be carried over for up to 15 succeeding years.

By conserving a property with a conservation easement, landowners can preserve their vision for the land and also create a lasting legacy. Conservation easements are one of the most powerful, effective tools available for the conservation of private lands. Their use has successfully protected millions of acres of wildlife habitat and open space in the United States and other countries, while allowing the landowners to continue owning and using the property in ways that do not negatively impact the land's conservation values as defined by the easement.

8.6. Landowner Engagement, Responsibilities, and Commitments

Conservation programs for private lands require varying levels of effort, planning, and commitment from the landowner. As noted at the beginning of this chapter, there are a number of potential challenges that may impact landowner conservation projects. Key factors to consider include the following:

- Knowledge gaps (e.g., information about habitats and species appropriate to the sites; the science behind various conservation action(s); or even recognition of the value of conducting conservation efforts in the first place)
- Complexity of funding programs and their requirements
- Project design, implementation, and maintenance
- Time and financial constraints.

Federal programs that provide financial assistance often require the landowner (or a private source) to provide matching funds or a match of in-kind labor and equipment. Programs also vary in time commitment, often with no guarantee of future support. For example, under the NRCS EQIP program, applications are accepted throughout the year (possibly with state deadlines for ranking and funding decisions), with successful applicants receiving one contract for support over one or more years. However, the execution of an easement under ACEP is a permanent commitment of the land and can take much longer to implement. Landowners must also be observant and careful, practicing due diligence to protect their own interests (whether by consulting experts or hiring professionals). Perhaps the most critical requirement for participating successfully in these



A USFWS biologist and private landowner holding a tiny Brawley's Fork Crayfish / Lauren Neale, TN Cattleman's Association

programs is the landowner's willingness to learn and to spend the time required to successfully implement their chosen actions.

8.7. Additional Resources for Private Lands Conservation

Finally, three printable, shareable hands-on resources for landowners are provided. The Landowner's Conservation Planning Guide is a two-page self-assessment that allows landowners to record their answers to a series of questions critical to thinking through conservation project planning. Table 8.4, Tennessee Private Lands Resources, provides a wealth of information and web links for private land conservation information, organized by the following categories:

- Educational resources for private landowners
- Nonprofit land trusts
- Wildlife research programs and organizations
- Plant resources
- Water and wetland protection

Finally, Fig. 8.6 is a Seasonal Conservation Calendar specific to Tennessee that can serve as a reminder in planning management and stewardship activities throughout the year.

TENNESSEE LANDOWNER'S CONSERVATION PLANNING GUIDE

LANDOWNER & PROPERTY INFORMATION

Name(s):

Phone Number:

Email:

Property Address:

City:

Zip Code:

County:

Mailing Address (if different):

Total Acreage:

Acreage of Potential Project Area(s):

UNDERSTANDING YOUR PROPERTY

Current Land Use:

☐ Agriculture

Please Specify:

__ Livestock

__ Row Crops

__ Mixed Produce

__ Dairy

__ Nursery/Greenhouse

__ Other

☐ Forestry

☐ Early Successional/ Old Field

☐ Open Space

☐ Residential

☐ Suburban/Development

☐ Other: _____

Existing Easements:

☐ Mining

☐ Timber

☐ Conservation

☐ Agriculture

☐ Utility/Access Right of Way

☐ Other

If checked, please note easement holder(s):

Adjacent Land Uses (Check all that apply)

☐ Residential

☐ Suburban/ Development

☐ Industrial

☐ Agricultural

☐ Forested

☐ Public and/or Protected Land

☐ Other: _____

Watershed/ Nearest Surface Water (if known):

GOALS FOR YOUR LAND

Improve Wildlife Habitat

__ Manage for a variety of species

__ Focus on specific habitats (prairie, hardwood forest, aquatic areas, etc.)

Restore or Establish Native Plant Communities

__ Forest restoration

__ Prairie or grassland restoration

Protect or Restore Your Land

__ Control erosion

__ Manage invasive species

__ Recover from storm or fire damage

Plan for Your Land's Future

__ Manage or sell timber

__ Participate in carbon markets

__ Establish a conservation easement

Enhance Water Resources

__ Protect or restore riparian buffers

__ Improve pond, wetland, or stream habitat

Diversify Working Lands

__ Harvest non-timber forest products (nuts, mushrooms, decorative greenery)

__ Agroforestry or silvopasture systems

Preserve Cultural or Historic Features

__ Archaeological sites, homesteads, cemeteries, etc.

Other: _____

LANDOWNER CAPACITY & PLANNING

Primary Reasons for Owning Your Land

(Check all that apply):

- ☐ Income Generation
- ☐ Family Legacy
- ☐ Recreation (hunting, fishing, trails, etc.)
- ☐ Stewardship (forestry/wildlife)
- ☐ Farming
- ☐ Timber Production
- ☐ Other: _____

Special Considerations Present

(Check all that apply):

- ☐ River and/or Stream
- ☐ Spring
- ☐ Sinkhole
- ☐ Cave
- ☐ Known Rare Species
- ☐ Historic Site
- ☐ Other: _____

How much time can you devote to conservation activities each year?

- ☐ Minimal
(occasional involvement, prefer contractors)
- ☐ Moderate
(seasonal or project-based work)
- ☐ High
(hands-on management, frequent involvement)

Estimated time commitment for project implementation and maintenance:

- ☐ Less than 5 Years
- ☐ 5-15 Years
- ☐ 15-30 Years
- ☐ Permanent
- ☐ Uncertain

PARTNERSHIPS & IMPLEMENTATION

Partners you've worked with before:

- ☐ NRCS and/or Local Soil & Water Conservation District
- ☐ Tennessee Division of Forestry
- ☐ TWRA
- ☐ UT/TSU Extension
- ☐ Other: _____
- ☐ None

Interested in:

- ☐ Technical Assistance
- ☐ Financial Assistance
- ☐ Tax Incentives
- ☐ Reduced Management Costs (shared equipment, group contracts)
- ☐ Disaster Recovery Programs
- ☐ Conservation Easements

PARTNERSHIPS & IMPLEMENTATION

Briefly summarize past projects or assistance received (if any):

Other notes or special considerations:

Table 8.4 Tennessee private lands resources

Technical Advisors	Resources and Education of Private Landowners	Nonprofit Land Trusts	Wildlife Research	Plant Resources	Water and Wetland Protection Organizations
Biodiversity Division - Tennessee Wildlife Resources Agency	DarkSky	American Farmland Trust	American Bird Conservancy	Center for Plant Conservation	BluewaysTN
Division of Natural Areas - TN Department of Environment & Conservation	Fire Adapted Communities Network	Ducks Unlimited	Bat Working Group	East Tennessee Nursery	Boone Lake Association
Land and Water Stewardship Section - Tennessee Department of Agriculture	Habitat Conservation Program - TNWF	Foothills Land Conservancy	Bog Learning Network	Southeast Exotic Pest Plant Council Invasive Plant Manual	Cumberland River Compact
Partners for Fish and Wildlife - US Fish & Wildlife Service	Hatchie River Conservancy	Land Trust Alliance	Conservation Fisheries	Southern Appalachian Botanical Society	Duck River Watershed Planning Partnership
Quail Forever	Invasive Species Assistance	Legacy Parks Foundation	Freshwater Mollusk Conservation Society	Tennessee-Kentucky Plant Atlas	Duck River Watershed Society
Southeastern Grasslands Institute	Landscape Management Plan	Open Space Institute Land Trust	Knoxville Zoo	The Shortleaf Pine Initiative	Emory River Watershed Association
Tennessee Division of Forestry	Landscape Management Plan - TN Division of Forestry	Swan Conservation Trust (active on the western Highland Rim)	Memphis Zoo	University of Tennessee Herbarium	Friends of the Duck River
Tennessee Wildlife Federation	My Tennessee Woods	Tennessee Wildlife Federation	Motus	USDA NRCS Plant Database	Harpeth River Watershed Association

Technical Advisors	Resources and Education of Private Landowners	Nonprofit Land Trusts	Wildlife Research	Plant Resources	Water and Wetland Protection Organizations
TN Natural Resources Conservation Service - US Department of Agriculture	National Alliance of Forest Owners	TennGreen Land Conservancy	Nashville Urban Bird City		Little River Watershed Association
University of Tennessee Extension	Protect TN Forests	The Conservation Fund	Nashville Zoo		Obed Watershed Community Association
	Tennessee Agricultural Enhancement Program	The Land Trust for Tennessee	Tennessee Amphibian Monitoring Program		Protect our Aquifer
	Tennessee Invasive Plant Council	The Nature Conservancy	Tennessee Aquarium		Sewanee Mountain Grotto
	The Family Forest Carbon Program	Wolf River Conservancy	Tennessee Herpetological Society		Southeast Aquatic Resources Partnership (SARP)
	TN Forestry Association		US North American Bird Conservation Initiative (NABCI)		Southern Alliance for Clean Energy
	Tennessee Naturalist Program				Stones River Watershed Association
	TN Prescribed Fire Council				Tennessee Scenic Rivers Association
	TN Wildland Fire Prevention				Tennessee Section of the American Water Resources Association

Technical Advisors	Resources and Education of Private Landowners	Nonprofit Land Trusts	Wildlife Research	Plant Resources	Water and Wetland Protection Organizations
					Tennessee Stormwater Association
					Watts Bar Lake Association
					Wetlands America Trust
					Wolf River Conservancy

Seasonal Conservation Actions for Tennessee Landowners

Practical actions you can take each season to care for your land and wildlife



Spring

March - June

- Conduct early growing season prescribed burns
- Mow fields before green-up to control woody growth; be mindful of nesting activity
- Spot spray exotic invasive plants
- Plant warm-season grasses, pollinator habitats, and bare-root seedlings
- Slowly draw down water impoundments
- Monitor for emerging forest pests



Summer

June - September

- Conduct late growing season prescribed burns
- Timber Stand Improvement (TSI; selective removal of less desirable trees)
- Treat woody invasives with herbicide
- Check water passage structures; clear blockages
- Plant cool-season food plots or cover crops
- Monitor for erosion on disturbed sites
- Pond maintenance



Fall

September - December

- Prepare firebreaks and remove snags
- Spray fescue and other cool-season grasses
- Continue Timber Stand Improvement
- Plant cool season cover crops to reduce erosion
- Protect young trees and install nest boxes
- Order tree seedlings for late winter planting
- Mitigate fuels around structures ahead of fire season



Winter

December - March

- Conduct dormant season prescribed burns
- Continue TSI until sap flow begins
- Disk fields and fell browse species to encourage stump sprouts
- Plant trees, shrubs, and wildflower mixes
- Clean and install nest boxes
- Prune woody trees and shrubs
- Remove old fencing
- Check water passage structures; clear blockages



Year Round Activities

- Construct brush piles for wildlife habitat
- Watch for invasive species, pests, and disease
- Maintain trails, roads, and fences
- Monitor wildlife activity and habitat use
- Keep field notes on management activities

Early detection and maintenance saves time and money!

Actions and schedule may vary by region and site objectives. Consult your local TDF, TWRA, NRCS, or UT/TSU Extension office for site-specific guidance.

Figure 8.6 Seasonal conservation actions for Tennessee landowners