





## The Gopher Tortoise: A Keystone Species



Georgia's official state reptile, the gopher tortoise is a conspicuous animal in the sandy lands of our Coastal Plain region. Gopher tortoises dig deep, long burrows that provide critical shelter for them and hundreds of other animal species. Gopher tortoises eat leaves and fruits, and benefit plant communities by dispersing seeds across the landscape and improving germination. Because the gopher tortoise has such a profound impact on the ecosystems where it lives, it is considered a "keystone species" that is critically important to the survival of many other species and to the health of the overall system.

## Population Abundance and Persistence



Though gopher tortoises appear to still be fairly well distributed throughout their range and are frequently encountered in some areas, their populations have been affected by human activities such as the direct take of tortoises, conversion of forests to other uses, management of forests in ways that reduce tortoise habitat quality, and the suppression of fire. These impacts have led to a decline in overall tortoise numbers and acres of occupied habitat. Because gopher tortoises are long-lived animals (commonly attaining ages of 60 years or more) and adults have few natural predators, individuals can persist in some areas for several years even when the amount and quality of habitat has been greatly diminished. Small, isolated populations and those in marginal habitat often lack sufficient reproduction and juvenile recruitment, and may be in a slow, steady decline. For example, in many areas tortoises disappeared from much of the landscape as dense vegetation shaded out the ground, but a few individuals have managed to hang on by utilizing open roadsides. In these situations, roadside surveys might seem to falsely indicate healthy populations.



Photo by: John B. Jensen

## Habitat Requirements

Compared to many species, habitat requirements for gopher tortoises are relatively simple. Sandy, well-drained soils provide a suitable substrate for burrowing, and plentiful sunlight hitting the ground ensures an abundant growth of the grasses and forbs needed for food. Sunny areas also provide basking opportunities for these “cold-blooded” reptiles, and sunny patches of bare soil are used as nesting sites. Historically, frequent fires helped maintain suitable open habitat across the landscape. Tortoises do not need to drink – they get all the moisture they need from the plants they eat. Sites with sandy soil, an open pine overstory, and an understory dominated by native herbaceous vegetation (usually dominated by wiregrass) provide the best habitat.

## Habitat Management

The essentials of managing habitat that is suitable for gopher tortoises include minimizing soil disturbance, protecting burrows, and maintaining a diversity of groundcover plants by ensuring that sufficient sunlight reaches the ground. Prescribed fire, timber harvest, and selective use of herbicides can all be valuable management tools. With careful planning and minimal trade-offs, pine timber can be managed for good economic return while maintaining viable populations of tortoises. Many other species of wildlife will benefit as well, including bobwhite quail and wild turkey.

### ■ Longleaf vs. Other Pines

Tortoise management can be successfully integrated with forestry practices in all pine species, but longleaf pine is well suited for several reasons. Longleaf pines have open crowns that allow more sunlight to reach the ground. The trees can be burned at younger ages and can be managed on longer rotations. Further, longleaf pines are more disease- and insect-resistant when compared to loblolly pines, and more resistant to wind damage, due to the deep taproot and smaller crown density, than other southern pine species.

## ■ Site Preparation

When establishing pine stands, protecting tortoise burrows and maintaining forage plants are important considerations. Heavy mechanical site preparation such as root-raking, bedding, and piling should be avoided because these practices can collapse burrows and negatively impact groundcover plants. Broadcast applications of a broad-spectrum herbicide that reduce grass and forb diversity and abundance can reduce forage availability for tortoises, at least in the near term. In contrast, use of selective herbicides can offer good control of weedy plants that compete with pine seedlings without significantly disrupting the herbaceous seed bank. On dry sites, pine seedlings usually have very little competition, so herbicide treatment might not be needed, or spot treatment of specific problem areas might be sufficient. Normally, a broadcast application is the only practical way to treat more mesic (wetter) sites where pine seedlings might face heavy competition. To ensure tree survival and minimal impact on gopher tortoise forage, consult a professional with advanced knowledge of herbicides regarding the type and rate of chemical to use.

## ■ Planting

Hand-planting is preferred because it creates less disturbance to the site. However, if thick brush is present it might be necessary to use a mechanical planter behind a V-blade tractor. If so, the blade should be set to barely skim the soil surface. Avoid the immediate vicinity of burrow entrances and aprons (sandy spoil area immediately in front of entrance) with all heavy equipment.



## ■ Thinning Pine Stands

To remain suitable for use by tortoises, pine stands should be kept open to allow sunlight to reach the ground. As a rule of thumb, about half of the ground should be lit during the middle of the day. This will require periodically thinning pines, generally to about 50-60 ft<sup>2</sup> of basal area per acre.

## ■ Prescribed Burning

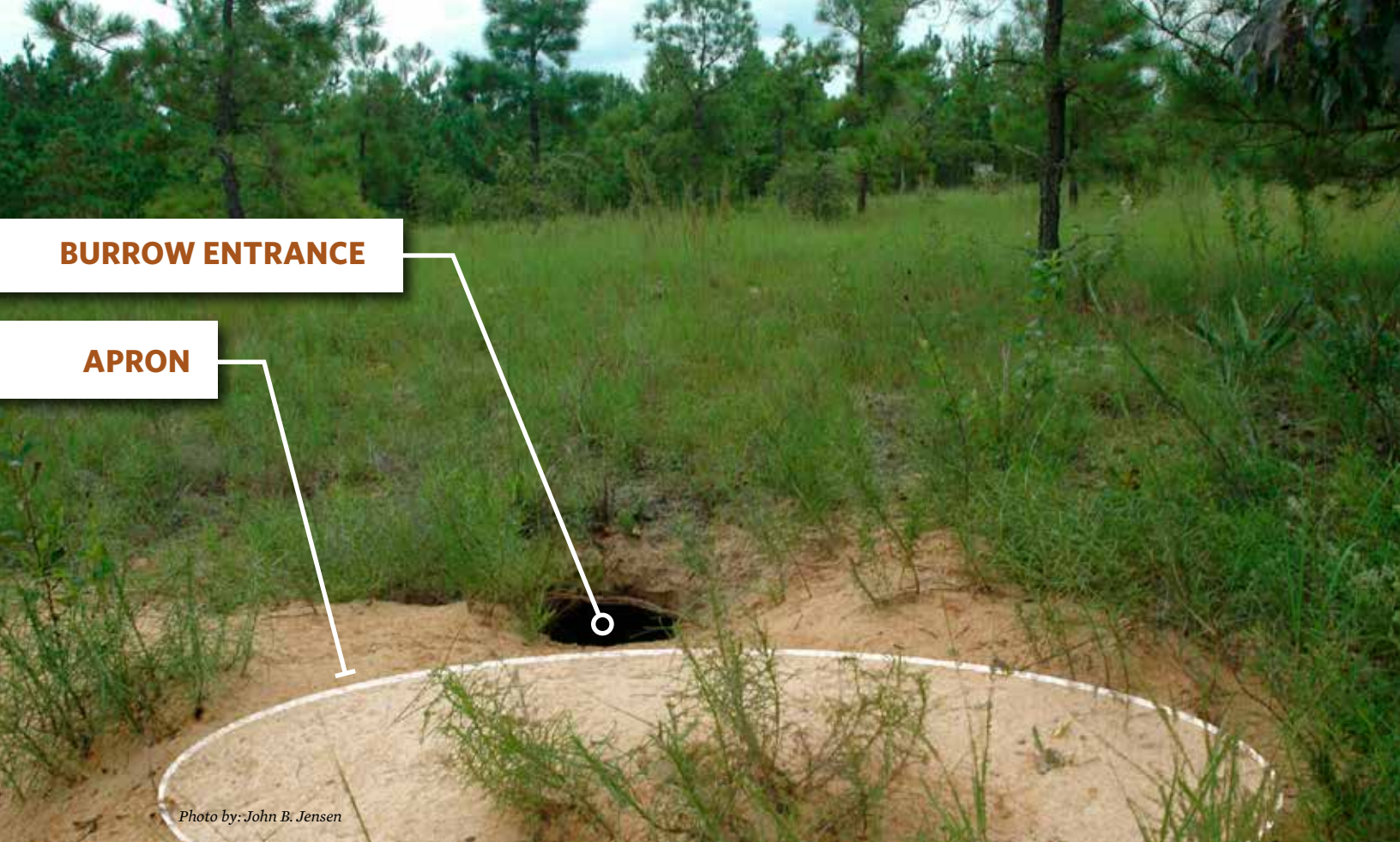
Burning reduces hardwood encroachment and encourages herbaceous plant growth, providing the sunlight and forage that gopher tortoises need. Burning should be implemented on a two-year cycle on most soils, but poorer sites that naturally have extensive areas of bare sand might only carry fire on a three- or four-year rotation. High fuel loads may dictate the use of cooler dormant season burns initially, but the long-term goal should be to incorporate mostly growing season burns to more accurately simulate a natural fire pattern and enhance forage plant diversity.



## ■ Pine Release (Mid-story Hardwood Control)

On sites with advanced hardwood encroachment, prescribed fire might not be a sufficient control tool. Mechanical or chemical treatments may be needed to knock back hardwood competition to a level where it can be controlled with fire. For chemical treatments, use a selective herbicide that will control the woody competition while having minimal impact on groundcover plants. Application rates should be the minimum labeled rate required to control the target plants.





**BURROW ENTRANCE**

**APRON**

*Photo by: John B. Jensen*

## Avoiding Impacts to Burrows and Nests

Though tortoises might be able to dig out of collapsed burrows, these valuable shelters should be protected from damage. Removing and reducing woody and exotic vegetation from around burrows is encouraged, but take care to avoid damaging the burrow entrance or the apron with heavy machinery or by felling and dragging trees. Marking burrows with stakes or flagging before timber operations, firebreak installation, road construction, and loading dock establishment, and instructing crews to maintain a 10-foot radius low-impact buffer around the entrances will minimize the chance that burrows collapse and eggs, which are often laid in the apron, are crushed. It is a good idea to make sure all workers (e.g. equipment operators, tree planters, etc.) know that tortoises and their burrows should not be disturbed. Remember, gopher tortoises and their eggs are protected from direct harm by state law.

## Property-level Management

The viability of a gopher tortoise population occupying a tract, stand, or property is affected by habitat conditions on adjoining parcels. Larger populations occupying more contiguous acres of habitat are naturally more likely to be sustained than smaller ones. Multiple landowners working cooperatively to maintain a landscape of suitable habitat will see the greatest success. An individual landowner with at least several hundred acres might best incorporate tortoise habitat management into a forest management approach that maintains timber stands of various age classes. In this situation, tortoises might be able to move among stands as conditions change with succession.

**GEORGIA DEPARTMENT OF NATURAL RESOURCES**  
**WILDLIFE RESOURCES DIVISION | NONGAME CONSERVATION SECTION**  
**116 RUM CREEK DRIVE | FORSYTH, GEORGIA 31029**  
**478.994.1438 | FAX 478.993.3050 | WWW.GEORGIAWILDLIFE.COM**

*This brochure made possible by:*

