



## Managing your pine forests for *Sunlight, Fire, and Quail*

*Pine stand, Greg Hagan; Quail, Ben Robinson*

Northern Bobwhites once thrived throughout a vast grassland ecosystem of open pine forest across Florida and the southeastern US. However, slow but dramatic change has occurred in the condition of pine forests over the last 75-80 years. Today, bobwhites and pine forests are largely disconnected. Changes in land use and decades of incompatible forest management have converted millions of acres of open forested grasslands into closed-canopy pine stands that provide no bobwhite habitat.

Northern bobwhites and other species require a vigorous and diverse herbaceous ground cover which includes **four basic components: (1) a mix of native clump grasses for nesting; (2) forbs, legumes, and wildflowers for seed and insect production; (3) scattered clumps of dense, low-growing woody shrubs for protection from weather and predators; and (4) bare soil.**

### Sunlight

Without abundant sunlight reaching the forest floor, none of the vital vegetation components for bobwhite habitat will develop or persist. Sunlight within a forested stand can be increased and maintained with frequent fire (see next page), periodic thinnings, careful forest regeneration techniques, and managed openings.

#### Thinning

A basic rule of thumb is when you walk through the pine forest, sunlight should be on your head and your boots at least half the time. Commercial timber harvests are necessary to thin the trees, open the canopy, and allow sunlight to reach the ground. To produce suitable bobwhite habitat, a pine forest must be thinned more aggressively than typical commercial harvests.



*Example of 50 square feet of basal area, photo by Greg Hagan.*

In southern yellow pine forests (loblolly, slash, longleaf, and shortleaf pines), most commercial thinnings aim to reduce the pine tree density to a \*basal area of 75–80 square feet per acre. In contrast, to produce suitable habitat for bobwhites, pine stands should be thinned down to a basal area of 50 square feet or less. To maintain quality bobwhite habitat, the trigger point for the next commercial thinning is when the stand once again reaches 70 square feet of basal area.

#### Regeneration

The bobwhite habitat portion of a pine forest's life cycle can be increased with careful pine regeneration practices. Pine forests can be regenerated through natural or artificial means and managed as even-aged or uneven-aged stands. Regardless of the regeneration and management method, the bobwhite objective is to maintain a continuity of vigorous and diverse clump-grass/ forb/shrub ground cover across space and time.

Where bobwhite habitat is one objective, wider tree and row spacing (such as 8'x12') will allow establishment and maintenance of desirable native clump grasses, forbs, legumes, wildflowers, and shrubs. Where bobwhites are the primary objective and soil types are suitable, longleaf pine plantings should be considered as longleaf is generally most compatible with bobwhite habitat management. Longleaf pine plantings on 12'x12' or greater spacing, properly managed with prescribed fire, may provide excellent habitat conditions throughout the life of the stand. (Natural regeneration by seed tree or shelterwood methods often results in dense seedling stands that quickly shade out the herbaceous ground cover.)

#### Openings

Forest openings can provide supplemental bobwhite habitat but are not a substitute for a properly managed forest. It is much better for bobwhites to have the entire stand managed with sunlight and fire without openings than to have openings scattered throughout a dense, unburnt stand. Planning new permanent forest openings is most practical if conducted in conjunction with timber harvest and site preparation. For optimal bobwhite benefit, at least 20 percent of the property should be developed into permanent openings that are three to five acres in size. Roads and firebreaks can also be managed

*\*Basal area is a common term used to describe the average amount of an area (usually an acre) occupied by the total cross-sectional area of all the stems in a stand, expressed as square feet per acre. Thus, the basal area "sweet spot" for maintaining high quality bobwhite habitat in most pine forests is between 40–70 square feet of basal area.*

to provide bobwhite habitat. Openings, roads and firebreaks are most beneficial to bobwhites if managed with frequent soil disturbance as “weedy” brood foraging habitat and promoting desirable plants such as beggarweed, ragweed, and partridge pea.

## Fire

Frequent fire is a natural ecological process in pine forests across the southeast, and was the #1 factor keeping pine forests and bobwhites connected for millennia. Unfortunately, decades of determined fire suppression have eliminated this natural ecological disturbance from many landscapes. Fire is an essential ingredient for bobwhites in pine forests (i.e., Sunlight and Fire), and is especially important to provide the ground cover and bare soil (20 percent is optimal) bobwhites require. As mentioned earlier, bare soil underneath the herbaceous layer is a necessary component of ground cover management as it allows for easy foraging and movement for bobwhite chicks and adults. Frequent fire is also essential to control encroaching hardwood sprouts and encourage desirable native grasses, legumes, forbs, and shrubs to thrive. Finally, frequent fire is necessary to clear the duff on the forest floor, bare some of the soil, increase soil surface temperature, release nutrients, and allow the native grasses and forbs already in the seed bank to germinate.

In general, across Florida and the southeast, each acre in pine forests should be burned every 2–3 years, depending on the situation. However, managers should apply fire to only one-half to one-third of a pine forest on a rotational basis to leave enough residual bobwhite nesting and escape cover from the previous growing season.



*Controlled burn in pine stand in Florida, photo by Ryan Miller.*



Insert  
Logo  
Here

Across sites of moderate to high fertility, fire should be applied on a 2-year interval with half of the burnable woods being burned every year. On infertile sites and especially during drought years, a 3-year burn frequency may be sufficient. However, use caution;



*This dense, unburned pine stand is not suitable bobwhite habitat, photo by Reggie Thackston.*

if left unchecked, hardwood sprouts can quickly outgrow prescribed fire’s controlling ability and begin shading out desirable plants. Once the encroaching hardwood understory outgrows the controlling ability of prescribed fire, mechanical and/or chemical control is often needed to reduce fuel loads and increase fire effectiveness. Used sparingly, these techniques can jump start restoration efforts by shifting plant communities that can be maintained with frequent fire.

## Conclusion

To optimize results and minimize costs, landowners should seek technical guidance from a wildlife biologist or professional forester well versed in integrating bobwhite and forest management prior to initiating forest regeneration practices.

Visit our partners for more information:

- 
- 
- 
- 

