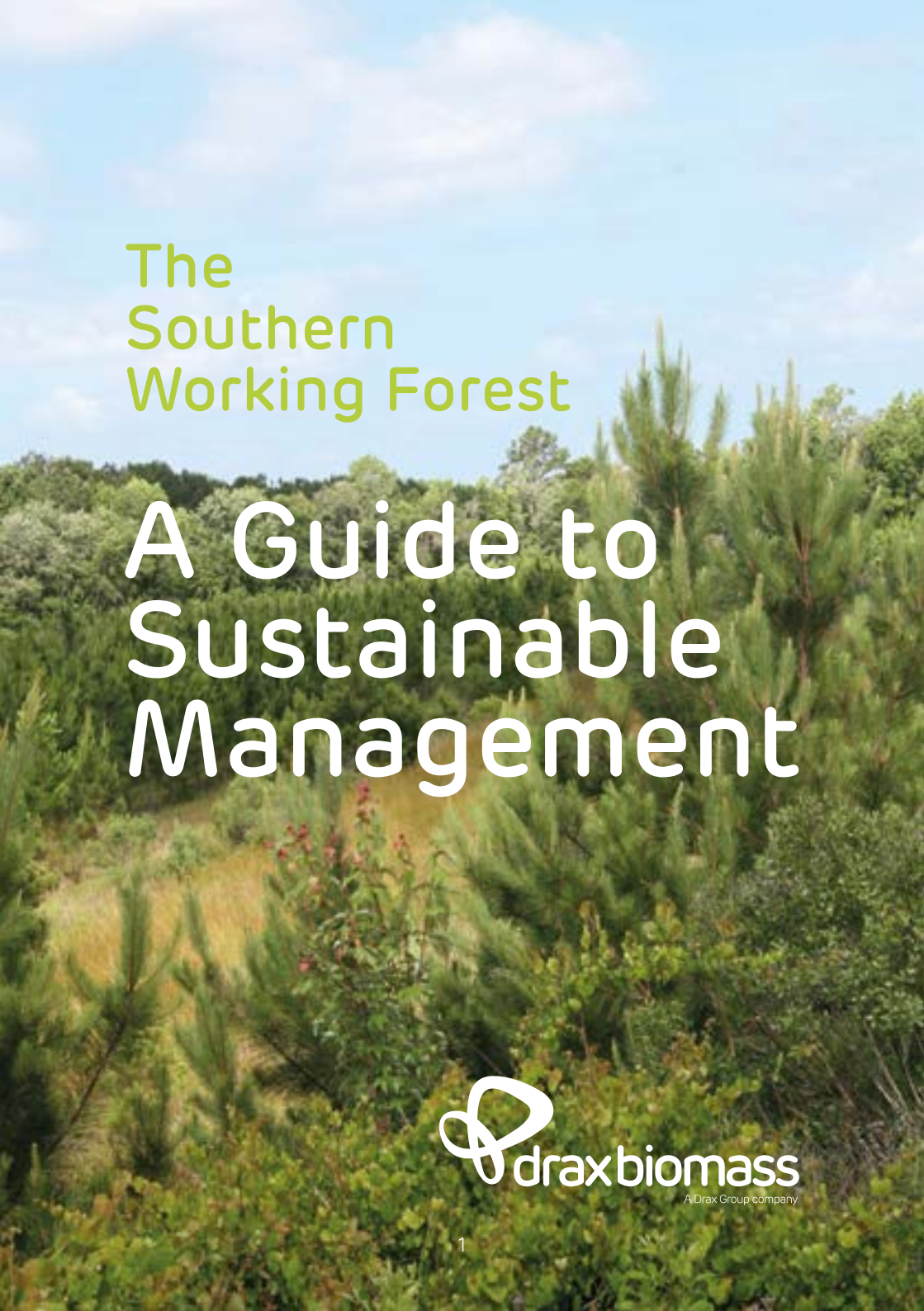


The Southern Working Forest

A Guide to Sustainable Management

drax biomass
A Drax Group company

Contents

The Working Forest

Working forests provide a multitude of benefits. They filter our water, clean our air, support a diversity of plant and wildlife species, and supply valuable wood products. To own a forest is both a privilege and a challenge. A well-managed forest can produce a significant return on investment while simultaneously providing recreational opportunities, aesthetic beauty, and an unparalleled level of personal satisfaction. The challenge forest landowners face is how to optimize the values they want their forest to provide. When forest landowners successfully meet their own goals, forests stay forests, and landscape-level ecological and economic benefits are achieved.

This quick reference guide is intended to help forest landowners achieve their management goals. It has been designed as a tool to help prompt the right questions, connect with the right resources, and support the planning process.

"A conservationist is one who is humbly aware that with each stroke (of the axe) he is writing his signature on the face of the land."
Aldo Leopold

Resources

Everyone has a unique set of goals for their forest. Regardless of your specific motivations, or your level of forest management experience, a review of currently available resources is recommended.

Forestry is a dynamic and evolving field and professional natural resource managers are primed to provide you with what you need to succeed. A good place to start is with the state forestry commission, state wildlife commission, or the Natural Resource Conservation Service (NRCS). A list of resources and web-links is included in the **Contacts and Resources** section at the end of this guide.

You will quickly find that state forestry and wildlife agencies, federal agencies, as well as private resource managers (consultants and industry foresters and biologists) form a network of professionals that are very willing to help.

Ask the Right Questions

No matter who you start with (consulting forester, industry forester, state forestry or wildlife agency representative, NRCS) you will want to ask some key questions.

The first step is to make sure your primary management goals are clear. For example, are you interested in maximizing timber revenue, enhancing wildlife habitat, or providing other recreational and aesthetic benefits? Is it a mix of these? Defining your priorities and developing a set of questions specific to your goals will help assure you get the guidance and support you need. The following questions may help you get started:

1. If you are Harvesting, consider asking for:

- Information on local timber markets and products your forest is expected to yield (i.e. sawtimber, chip-n-saw, pulpwood) – this helps assure harvest timing will meet your economic goals
- General information on harvest planning – Best Management Practices for water quality (BMPs), biodiversity, residue management, aesthetics
- Information on how thinning can enhance sawtimber, forest health, and wildlife habitat
- A list of certified or registered foresters in your area (see Contacts and Resources) – certified and registered forester programs verify credentials and require continuing education
- A list of trained loggers – the Sustainable Forestry Initiative® (SFI) and state forestry commissions jointly administer training and require continuing education (database available – see Contacts and Resources)

2. If you are Regenerating, consider asking for:

- The pros and cons of planting versus natural regeneration
- Information on site preparation, its costs and benefits
- Techniques that can be used to enhance forest growth (i.e. competition release and fertilization)
- Available cost-share programs and what they entail

3. If you are Managing for Wildlife, consider asking for:

- Assistance from a Private Lands Biologist within the state wildlife agency
- Information on cost share for wildlife enhancements
- Information on U.S. Fish and Wildlife Service (USFWS) programs for protected & at-risk wildlife species (if any are known to occur on or near your property)

Forest Planning and Certification

Developing a forest management plan is the ideal way to maximize the potential of your property. A plan can turn a woodlot into a sustainable working forest that meets your financial and stewardship goals.

There are many tools and resources available to help you get started with a management plan. State forestry and wildlife agencies, the Natural Resource Conservation Service (NRCS), and the Association of Consulting Foresters are good places to start (see the Contacts and Resources section at the end of this guide).

The American Forest Foundation® (AFF) provides a free online tool to get you started on drafting your own plan (https://mylandplan.org/). AFF also administers the American Tree Farm System®, which offers family forest landowners an opportunity to "certify" that their property is being managed sustainably.

Certification to internationally recognized forest certification schemes can open markets and provide incentives to landowners who are managing their forest sustainably. In the United States, there are three primary certification systems that provide this international recognition: the Sustainable Forestry Initiative®, the American Tree Farm System®, and the Forest Stewardship Council™ (see Contacts and Resources). The American Tree Farm System has been developed specifically to serve the needs of family forest owners. SFI®, although traditionally geared towards larger ownerships (>10,000 ac), is also developing tools for small landowners. FSC® serves large ownerships as well as smaller landholdings through a group certification program.

Wildlife and Biodiversity

Many of our game and non-game species benefit from active forest management. Regenerating forests provide browse for deer and a mix of grasses and forbs are perfect for quail and turkey poults, which require an insect-rich foraging area. Thinning also allows sunlight to hit the forest floor, which can enhance the herbaceous layer within a forest and benefit these same species. Southern pine stands naturally self-thin, so harvesting can effectively accelerate the maturity of a stand by mimicking the open forest structure of an older forest. Turkeys especially appreciate open forests, which provide foraging as well as roosting opportunities.

Careful harvest planning can further enhance wildlife habitat. Streams, seeps, and ephemeral wet areas are key habitat features. Protecting the integrity of these areas by buffering at final harvest can retain and attract species that normally forage and nest in mature trees and enjoy cool, moist microclimates.

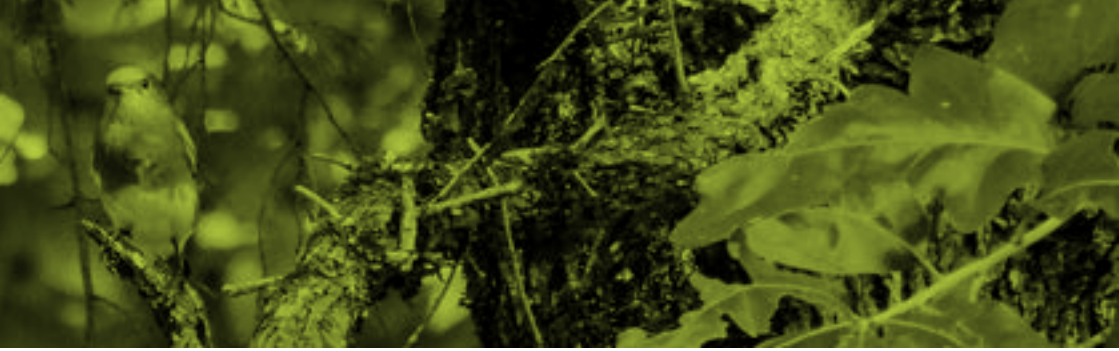
Buffers or stream side management zones (SMZs) can also act as travel corridors. Encouraging your logging contractor to leave standing dead trees (snags) will provide additional foraging and perching opportunities for birds. When they fall, they will offer valuable foraging and cover opportunities for amphibians, reptiles, and small mammals.

Species of Concern and Unique Natural Communities

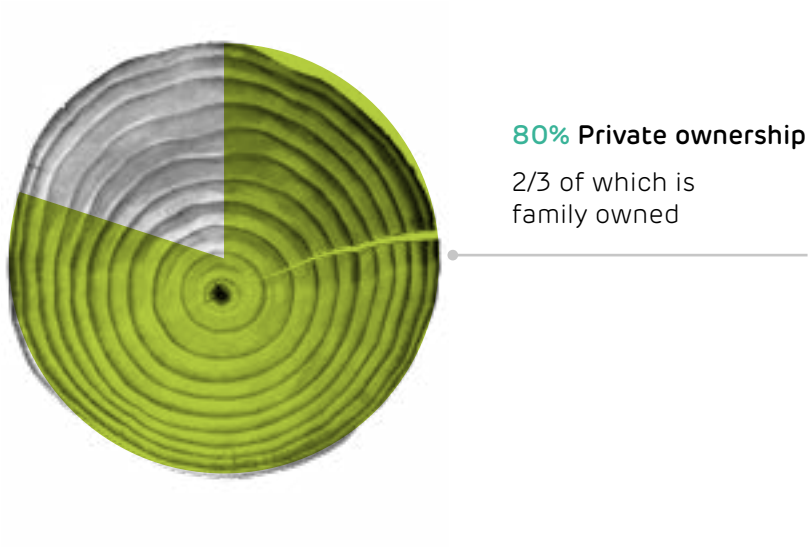
It is important to consider that your property may support a wildlife species or natural community that is federally protected or of global or regional concern. Animals protected under the federal Endangered Species Act (ESA) carry regulatory obligations that landowners should be aware of. This select group of species is protected from "take" which includes habitat modification that interferes with the animal's ability to find food, shelter, or reproduce. It is prudent for landowners to be aware of any federally listed species that might exist on their property.

Most large sawmills, papermills, and pellet facilities like Drax Biomass adhere to sustainability standards (i.e. SFI, FSC) that require diligence around federally threatened or endangered species, as well as species and community types of global concern. Therefore, you will likely be notified if a concern exists on your property, but it would not hurt to ask! Some federally protected species that may be encountered in the south include the red-cockaded woodpecker, gopher tortoise, black pinesnake, Louisiana pinesnake, a suite of aquatics, and the bald eagle (protected under the federal Bald and Golden Eagle protection Act).

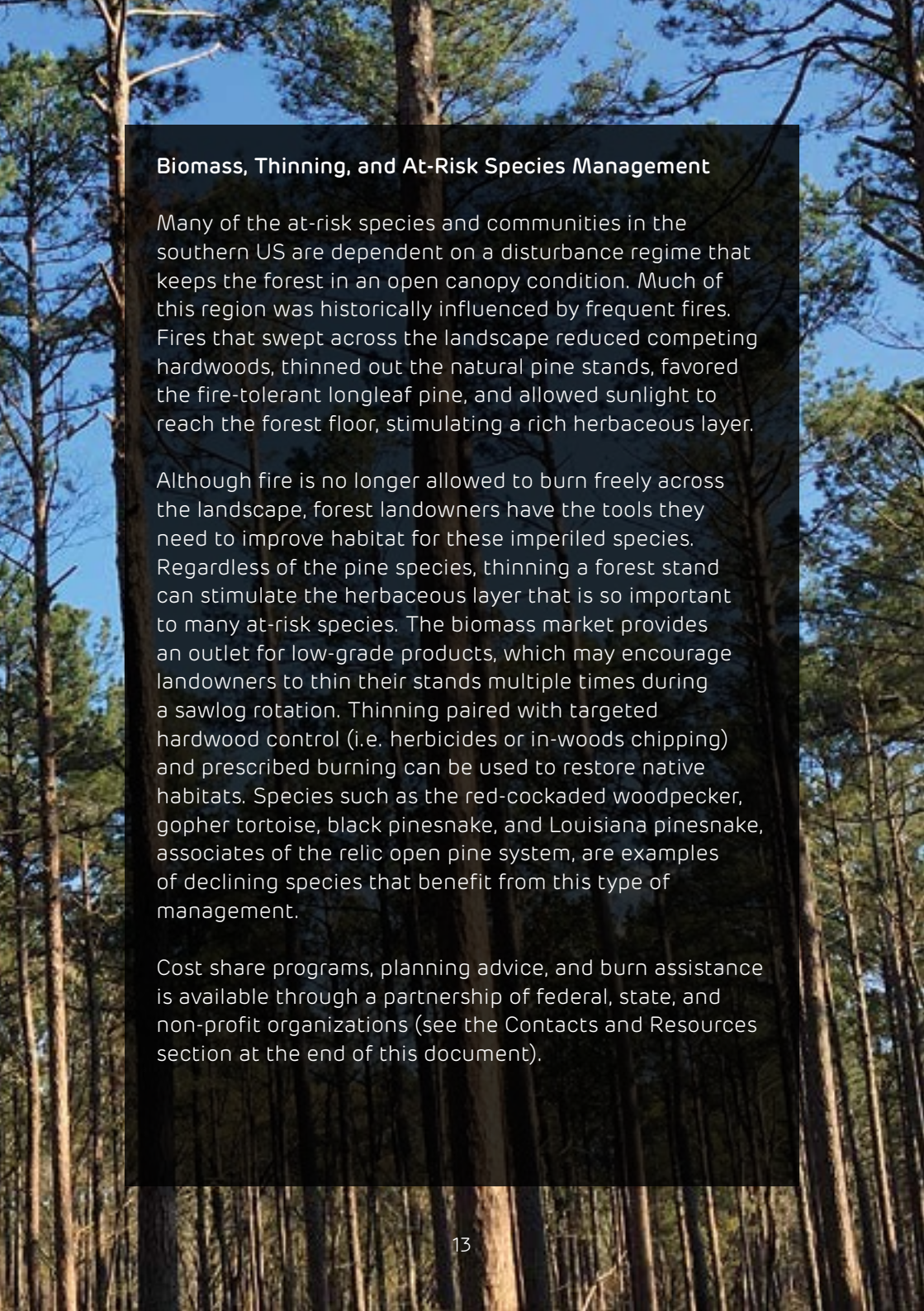
Louisiana pinesnake. Photographer: Brendan Kavanagh



Southern forestland



With over 80% of southern forestland in private ownership (2/3 of which is family owned), private landowners, and the forest products industry that sources from them, can make a significant contribution to the conservation of our natural heritage. Drax Biomass has a commitment to not source from sensitive ecosystems like cypress-tupelo forests (http://www.draxbiomass.com/setting-standard-responsible-sourcing/), as well as communities considered of global and regional concern by Nature Serve (http://www.natureserve.org/).



Biomass, Thinning, and At-Risk Species Management

Many of the at-risk species and communities in the southern US are dependent on a disturbance regime that keeps the forest in an open canopy condition. Much of this region was historically influenced by frequent fires. Fires that swept across the landscape reduced competing hardwoods, thinned out the natural pine stands, favored the fire-tolerant longleaf pine, and allowed sunlight to reach the forest floor, stimulating a rich herbaceous layer.

Although fire is no longer allowed to burn freely across the landscape, forest landowners have the tools they need to improve habitat for these imperiled species. Regardless of the pine species, thinning a forest stand can stimulate the herbaceous layer that is so important to many at-risk species. The biomass market provides an outlet for low-grade products, which may encourage landowners to thin their stands multiple times during a sawlog rotation. Thinning paired with targeted hardwood control (i.e. herbicides or in-woods chipping) and prescribed burning can be used to restore native habitats. Species such as the red-cockaded woodpecker, gopher tortoise, black pinesnake, and Louisiana pinesnake, associates of the relic open pine system, are examples of declining species that benefit from this type of management.

Cost share programs, planning advice, and burn assistance is available through a partnership of federal, state, and non-profit organizations (see the Contacts and Resources section at the end of this document).

Best Management Practices for Water Quality

Best Management Practices (BMPs) are developed by state forestry agencies to meet the federal Clean Water Act (CWA) requirements. In most states these are considered voluntary best practices, however, CWA compliance is not voluntary. The landowner can be held liable if water quality or wetland resources are impacted by forest management activities.

BMPs should be considered in a logging plan, with special attention to stream crossings and steep or erosive areas. Examples of BMPs include use of temporary bridges, application of clean rock to stabilize low water crossings, water turn-outs on roads, and use of slash to stabilize skid trails.

Upon completion of a harvest, care should be taken to "close out" the job by identifying and stabilizing any bare soil areas that are susceptible to erosion. It is also important to remove all temporary stream crossings to ensure water is free to flow. Installing appropriate water diversions on roads, stabilizing skid trails with slash or waterbars, and seeding critical zones (i.e. stream approaches) are common practices. Logging contractors are generally well versed in BMP compliance. Selecting an SFI trained logger further assures BMP implementation. Most large receiving mills (lumber, paper, wood pellet) require trained loggers as a part of their certification compliance.


Tigercat

Managing Harvest Residues

Slash (tops, limbs, branches, and needles/leaves) can hinder regeneration and become frustrating if allowed to pile up on a landing. Unless burned, large slash piles can take a long time to decompose, potentially inhibiting regeneration or alternative use of the landing area (i.e. as a wildlife food plot).

The leaves and needles are rich in nutrients. Instructing loggers to pull this material off the landing and scatter it back in the woods as they return to pick up more logs, will help enrich the soil and maintain site productivity.

Slash can also be used to protect skid trails. This technique is especially useful on highly erodible soils or during wet weather events. Slashing skid trails reduces the need to install waterbars, which, if not properly installed, can sometimes exacerbate an erosion problem.

If the slash is fairly free of debris it may be processed by an in-woods chipper/grinder and used directly in the pellet or paper production process. Chips are also used as mill boiler fuel. Harvests utilizing a chipper not only appear "cleaner", they also reduce the need for mechanical site preparation prior to planting. Operational in-woods chipping/grinding leaves considerable organic material on the forest floor and can be done in a way that does not deplete site nutrients or negatively impact wildlife habitat. Some states have biomass harvesting guidelines to help harvest planners assess the risk of reclaiming harvest residues.

Pine Reforestation and Stand Management

Reforestation offers an opportunity to increase the productivity of your forest. Recent advances in seedling genetics, regeneration techniques, and intermediate silviculture treatments can result in significant volume gains. These silvicultural treatments do come at a cost, but the investment can pay off. To better understand the recent advances in pine silviculture and the investment implications, see The Development of Pine Plantation Silviculture in the South and What is Ahead for Intensive Pine Plantation Silviculture in the South, full reference included in the Contacts and Resources section at the end of this guide.

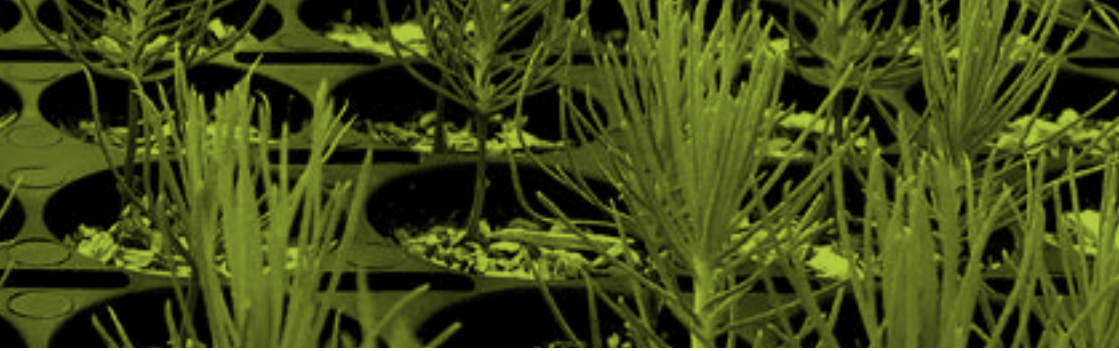
Questions to Consider

1. Will you replant the site or naturally regenerate?

- Replanting assures better genetics and density control.
- Natural regeneration is lower cost but requires attention to seed trees, can result in unpredictable stand densities, and lengthens the rotation.

2. Will you need site preparation? (if you plant)

- If the harvest residue level is high consider in-woods chipping.
- Consider mechanically "bedding" poorly drained pine sites. Raised planting beds can increase pine growth and ameliorate logging impact. Caution: poorly drained hardwood sites are likely not candidates for bedding and planting. Ask state forestry agency about CWA implications.
- If the site has a strong component of waxy leaved shrubs / hardwoods, targeted herbicide application may increase pine survival. Woody control also promotes the herbaceous layer and provides wildlife benefits.



3. Are you interested in learning about advanced silviculture techniques?

- Fertilization and release require additional investments but have proven to be very effective at increasing stand productivity and economic return.

Consider Invasive Species – Site preparation is a good time to control existing invasive plants/trees (i.e. kudzu, Chinese tallowtree, Chinese privet). **Consult the state forestry commission for more information on invasive species.

Chinese privet, Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Forest Biomass and Sustainability

Forest biomass is receiving international interest as a renewable energy source that can help reduce carbon in the atmosphere. A greenhouse gas savings of over 80% can result from burning sustainable biomass in place of coal. This is because biomass is sourced from forests which are actively capturing and storing atmospheric carbon, offsetting the emissions of biogenic carbon released during combustion.

In addition to greenhouse gas savings, the market for woody biomass supports investment in forest management, thereby increasing the productivity and overall carbon storage capacity of the land. The market for low-grade woody material provides a financial incentive to actively thin stands, making them more productive and shortening the length of time it takes to produce quality sawlogs. Harvest of these higher valued sawtimber trees then provides the landowner with financial resources to improve their forest. The promise of a better return on investment in the next rotation encourages landowners to plant improved seedlings, ensure good establishment, and keep forests as forests rather than converting them to other uses.

The biomass market also supports regional biodiversity and forest health. Many of our southern species are adapted to a historic disturbance regime that included frequent, low-intensity fires, which kept the forest in an open-canopy condition. Without fire, many pine forests are overstocked and have dense woody understories. These stands provide less value for wildlife and are more vulnerable to disease, insect infestation, and destructive wildfire.

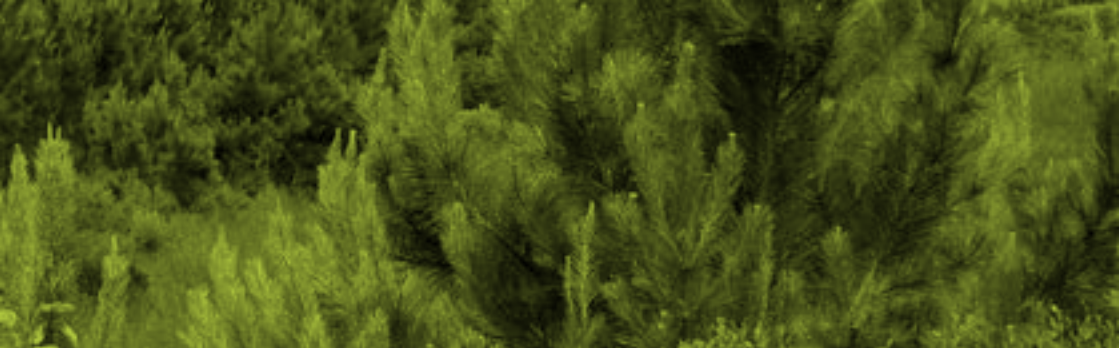
The biomass industry, which can utilize small diameter and low-value trees, encourages thinning and makes selective removal of understory woody competitors (in-woods chipping/grinding) financially feasible. The Association of Fish & Wildlife Agencies has recognized that bioenergy sourcing may even help restore habitat for priority species (see Contacts and Resources).

Contacts and Resources

Certification Systems
American Tree Farm System®
https://www.treefarmsystem.org/
Forest Stewardship Council®
https://us.fsc.org/en-us
Sustainable Forestry Initiate®
www.sfiprogram.org/

Cost Share Programs
The Southern Group of State Foresters provides a nice overview of cost share programs relevant to forest landowners:
http://www.southernforests.org/rural/cost-share-programs/

Management Guides, Tools, and References
BMP Manuals by State
(interactive map with links to current BMP manuals)
https://stateforesters.org/action-issues-and-policy/state-forestry-BMPs-map-o-o
MS Biomass Harvesting Guidelines
https://www.mfc.ms.gov/sites/default/files/Biomass%20Brochure%20Web%20reduced%20file%20size.pdf
American Forest Foundation online tool
http://www.mylandplan.org
Managing the Family Forest in Mississippi, Mississippi State University
https://extension.msstate.edu/sites/default/files/publications/publications/p2470.pdf
Forest Management, Arkansas Forestry Association
http://www.arkforests.org/?page=forestmanagement



Landowner Guide to Sustainable Forestry, Louisiana Forestry Association
http://laforestry.com/Programs/SustainableForestry/LandownerGuide.aspx
Allen, H.L., T.R. Fox, R.G. Campbell. 2005. What is ahead for intensive pine plantation silviculture in the South? SJAF 29(2) 62-69.
https://www.researchgate.net/publication/233553096_What_is_Ahead_for_Intensive_Pine_Plantation_Silviculture_in_the_South
Fox, T.R., E.J. Jokela, and H.L. Allen. 2007. The development of pine plantation silviculture in the Southern United States. JOF 105(7) 337-347.
https://www.researchgate.net/publication/233695859_The_Development_of_Pine_Plantation_Silviculture_in_the_Southern_United_States
Growing Your Assets, Texas Forestry Commission
http://www.texasforestry.org/docs/Growing_Your_Assets.pdf
IPaC Information for Planning and Consultation
https://ecos.fws.gov/ipac/
Association of Fish and Wildlife Agencies – Biomass Working Group References – Fish, Wildlife, and Bioenergy Opportunities
https://www.fishwildlife.org/

Forest Finance

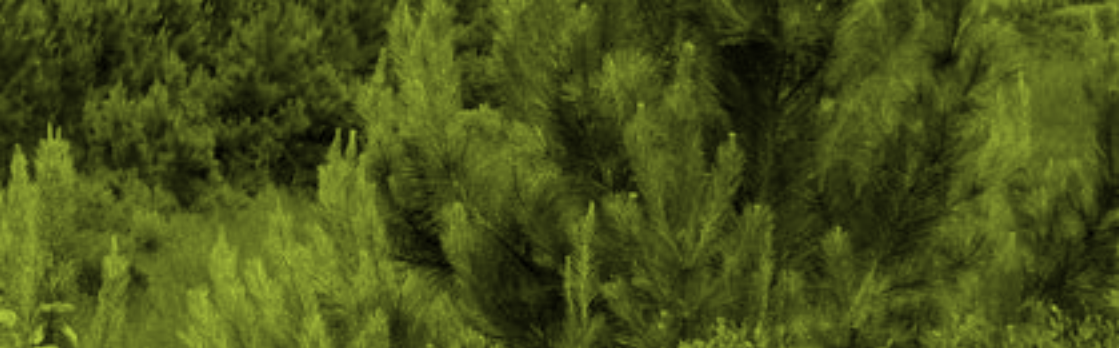
Financial Returns from Forest Management
http://forisk.com/blog/2018/01/31/financial-returns-forest-management/
Aunt Fanny Learns Forestry: Managing Timberland as an Investment. Brooks C. Mendell, 2015.
http://forisk.com/product/aunt-fanny-learns-forestry-managing-timberland-as-an-investment/

Contacts and Resources

National & Regional Organizations
Association of Consulting Foresters
https://www.acf-foresters.org/
Society of American Foresters
https://www.eforester.org/
The Wildlife Society
http://wildlife.org/
The Southern Group of State Foresters (SGSF)
http://southernforests.org/
Sustainable Forestry Initiative (SFI) Logger Training
http://www.sfiprogram.org/files/pdf/twentieth-report-on-the-status-of-logger-training-and-education/

Contacts by State

Alabama
Alabama Forestry Commission – http://www.forestry.state.al.us/
Alabama Forestry Association – http://alaforestry.org/
Alabama Department of Conservation and Natural Resources
http://outdooralabama.com/
Alabama NRCS – https://www.nrcs.usda.gov/wps/portal/nrcs/site/al/home/
Alabama Forest Owners' Association
http://www.afoa.org/aboutus.htm
Alabama Board of Registered Foresters
http://www.asbrf.alabama.gov/
Alabama Cooperative Extension Service
http://www.aces.edu/main/#
Alabama Forest Producers
http://alfafarmers.org/programs/divisions/commodities/forestry



Alabama Wildlife Federation
https://www.alabamawildlife.org/
Alabama Fish and Wildlife Service
https://www.fws.gov/alabama/

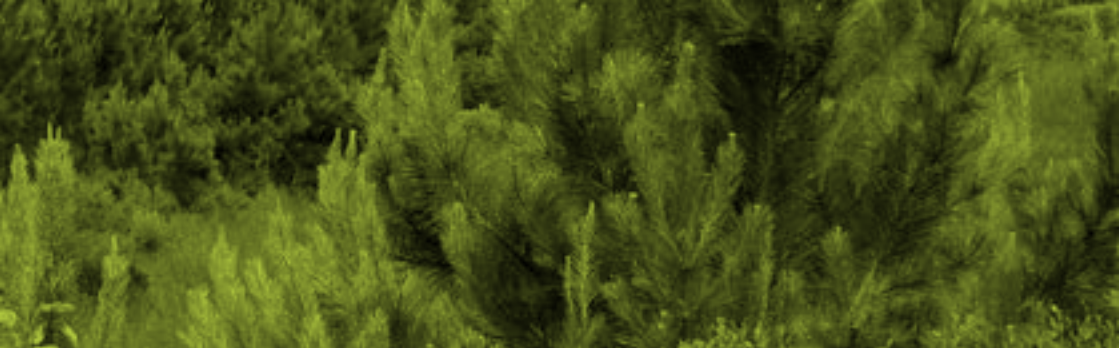
Arkansas
Arkansas Agriculture Department – Arkansas Forestry Commission
http://www.aad.arkansas.gov/
Arkansas Forestry Association – http://arkforests.org/
Arkansas Game and Fish Commission – https://www.agfc.com/
Arkansas NRCS
https://www.nrcs.usda.gov/wps/portal/nrcs/site/ar/home/
Arkansas Cooperative Extension Service
https://www.uaex.edu/environment-nature/forestry/
Arkansas Wildlife Federation
https://www.arwild.org/
State of Arkansas – Board of Registration for Foresters
http://www.arkansas.gov/abof/
Arkansas Urban Forestry Council
http://arkansastrees.org/
Arkansas Forest Stewardship Program
https://www.landcan.org/local-resources/Arkansas-Forest-Stewardship-Program/22754/

Louisiana
Louisiana Department of Agriculture and Forestry
http://www.ldaf.state.la.us/
Louisiana Forestry Association – http://www.laforestry.com/
Louisiana Department of Game and Fish – http://www.wlf.louisiana.gov/fishing/fishing

Contacts and Resources

Louisiana NRCS
https://www.nrcs.usda.gov/wps/portal/nrcs/site/la/home/
Louisiana State University Agricultural Center
http://www.lsuagcenter.com/topics/environment/forestry
Consulting Foresters of Louisiana
http://lasaf.homestead.com/LA_Foresters_Directory_e_file.pdf
Louisiana Wildlife Federation
http://www.lawildlifefed.org/
Louisiana Wildlife & Fisheries Foundation
http://www.lawff.org/

Mississippi
Mississippi Forestry Commission – http://www.mfc.ms.gov/
Mississippi Forestry Association – https://www.msforestry.net
Mississippi Department of Wildlife, Fisheries, and Parks
http://www.mdwfp.com/
Mississippi NRCS
https://www.nrcs.usda.gov/wps/portal/nrcs/site/ms/home/
MS Board of Registered Foresters
http://www.cfr.msstate.edu/borf/index.asp
MS State University Extension
http://extension.msstate.edu/
Mississippi Fish and Wildlife Foundation
http://www.wildlifemiss.org/
Mississippi Wildlife Federation
https://mswildlife.org/



Texas

Texas Forest Service
https://tshaonline.org/handbook/online/articles/met03
Texas Forestry Association
https://www.texasforestry.org/
Texas Parks and Wildlife
http://tpwd.texas.gov/
Texas NRCS
https://www.nrcs.usda.gov/wps/portal/nrcs/site/tx/home/
Texas A&M Forest Service
http://texasforestservice.tamu.edu/
Texas Land Conservation Assistance Network
http://www.texaslandcan.org/state-resources/Foresters/7
Texas Wildlife Association
https://www.texas-wildlife.org/
Texas Wildlife Association Foundation
http://twafoundation.org/
Wildlife Habitat Federation
http://www.whf-texas.org/

www.draxbiomass.com