



A Financial Look at Longleaf Pine

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Longleaf pine once dominated the southeast with its tall, straight, and rather stately appearance. When our earliest settlers arrived, the longleaf pine was readily harvested and fire was suppressed, causing widespread devastation of the longleaf pine ecosystem. More recently, the longleaf pine has been making a return with the help of natural resource professionals and the availability of cost-share assistance programs. In a past analysis, we reviewed the economic returns of loblolly pine and answered the question, does reforestation pay? Well, it most certainly does and with less risk than some other investments. However, the new question is---Does reforesting with longleaf pine pay?

Overview

This financial analysis is to determine the economic returns of longleaf pine investments using the SiMS2009 growth and yield simulator. Simulations were created to model a typical longleaf pine plantation managed for traditional timber products for high, medium, and low site index levels. The analysis will also take a look at how hunting leases, pine straw leases, and cost-share programs can have real impacts on the return of your investment. It should be noted that since wide scale longleaf plantations are a relatively new activity, there is a lack of growth and yield data from actual plantations so this should be considered as this information is read and studied within this factsheet.

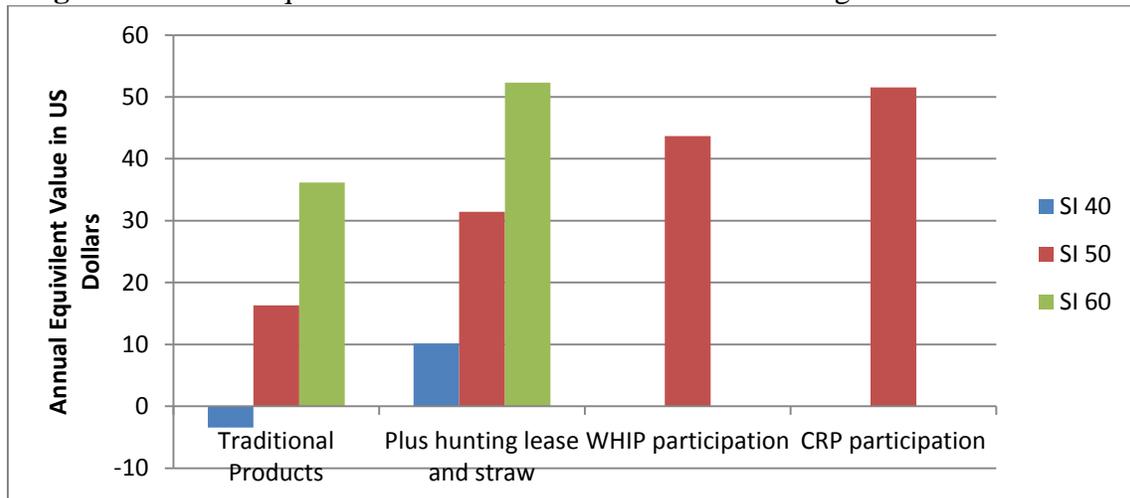
Table 1. Comparison of six different Longleaf Pine Management Scenarios for NPV, AEV, and IRR. Discount rate is 5%. State taxes, federal taxes and inflation are not included with this analysis.

Site Index ₂₅	Thinning Ages (years)	Final Harvest Age	Scenario	IRR (%)	AEV (\$/ac/yr)	NPV (\$/acre)
60 (High)	15, 23	31	Traditional Products Only	8.06%	\$36.18	\$564.06
			Plus Hunting and Pine Straw	9.90%	\$54.34	\$865.16
50 (Medium)	18, 27	34	Traditional Products Only	6.51%	\$16.34	\$264.53
			Plus Hunting and Pine Straw	8.31%	\$33.34	\$550.25
40 (Low)	24, 35	41	Traditional Products Only	4.65%	-\$3.44	-\$59.55
			Plus Hunting and Pine Straw	6.27%	\$11.72	\$205.77

Results

Internal Rate of Return (IRR), Annual Equivalent Value (AEV), and Net Present Value (NPV) have been calculated for each longleaf management scenario. Table 1 displays these values for each management scenario based on a high (60), medium (50), and low (40) site index, base age 25.

Figure 1. Annual Equivalent Values in US Dollars for each longleaf scenario simulated.



Traditional products only:

Based on the simulations, longleaf pine produces positive returns above the discount rate on the investment for medium and high quality sites. The rates of return for the SI 60 and SI 50 levels compare well with long-term, historic stock investments. AEV values for the high-quality site were \$36.18/ac/yr, \$16.34/ac/yr for the medium quality site, and -\$3.48/ac/yr for the low-quality site. As with any reforestation investment, the site productivity is the most important factor to take into account when determining species. The low-quality site index produced a negative NPV and AEV because revenue was not generated until much later in the investment compared to the other site index levels.

NPV and AEV on Pine Straw Harvesting:

Pine straw was raked 3 consecutive years prior to the first thinning. Pine straw harvests create an early stream of revenue that makes longleaf pine investments more attractive. The AEV for the SI 60 site was increased by \$8.16/ac/yr. AEV for SI 50 and SI 40 site indexes were \$7.00/ac/yr and \$5.16/ac/yr, respectively. Pine straw harvests increased the NPV for the SI 60 scenario by 26%; NPV increased by 47% for the SI 50 scenario; and pine straw increased the NPV for the SI 40 scenario by 155%.

NPV and AEV on Hunting Lease revenue:

The hunting lease revenue of \$10/ac/yr was applied to each scenario for every year of the rotation. As a result, the AEV for each scenario increased by the exact lease amount. NPV increased on the SI 60 scenario by 27.6% and on the SI 50 scenario by 63.9%. The biggest percentage gains for NPV came on the SI 40 scenario at an incredible 209%.

NPV and AEV on Hunting Lease and Pine Straw Harvesting:

Combining the annual hunting lease with 3 consecutive years of pine straw harvesting had the greatest effect on the financial returns. AEV increased by \$18.16 for SI 60 scenario; AEV increased by \$17.00 on the SI 50 scenario; and for the SI 40 scenario, AEV increased by \$15.16. NPV increased by 53%, 108%, and 445% respectively for the SI 60, SI 50, and SI 40 scenarios.

Disclaimer: This analysis is an estimation based on SiMS2009 growth and yield modeling and does not factor in risks such as wildfire, storm damage, pest, and disease outbreaks. The above results are in no way guaranteed.

Discussion

Landowners and conservation organizations have recently increased interest and efforts in establishing longleaf pine. This increased attention is due to several factors. Longleaf pine is less susceptible to disease and insect outbreaks; very resistant to fire, and is less likely to experience severe storm damage. Additionally, longleaf pine has the longest life expectancy out of the southern yellow pines, making it an ideal species for sequestering carbon from our atmosphere. However, the higher initial investment costs and the slower growth when compared to other species has strayed some landowners and resource managers away from investing in longleaf reforestation. All reforestation projects should utilize natural resource professionals that consider the soil types and other site conditions when selecting the best tree species to plant. Longleaf pine growth and survival rates will be maximized on the proper site.

Our analysis shows that landowners can achieve positive yields for their longleaf investments that compare well with the long-term, historic stock market returns. Timber growth results in annual increases in wood inventory per acre, which increases the financial return for the landowner. The addition of pine straw harvests and hunting leases also increase returns, especially in areas of lower-quality site index. Taking advantage of conservation program incentives can also help offset yearly property taxes and increase your returns.

Other Considerations

Wildlife Habitat

Managing to achieve a longleaf pine ecosystem can improve wildlife habitat. Prescribed fire can be applied annually within Longleaf pine forests, which will stimulate early-successional habitat. The longleaf pine tree canopies are less dense than other species allowing sunlight to stimulate grass and herbaceous vegetation growth at ground level. Longleaf pine nuts are enjoyed by many wildlife species. Also, longleaf pine is part of an ecosystem that fosters biodiversity.

Cost Share Programs

There are a few cost-share programs available that target longleaf pine. The two most popular are the Conservation Reserve Program (CRP), Wildlife Habitat Incentive Program (WHIP), and

Environmental Quality Incentive Program (EQIP). CRP is administered by the Farm Service Agency, and WHIP and EQIP is administered by the Natural Resources Conservation Services.

CRP brings the most value to your investment since it provides, on average, a \$63/acre/year lease payment over a 15 year contract and 50% of the establishment costs. To qualify for CRP, the property must have a history of row-cropped agriculture for 4 of the previous 6 years from 2002-2007.

Both programs produce very attractive returns, as shown within the return estimates listed in Table 2. Financial returns are greater in the CRP scenario in response to the annual lease payments. Pine straw harvests and hunting leases are not included in the table. State and federal taxes are also not included into this analysis.

Table 2. Estimated Financial Returns of a Longleaf Pine Reforestation Investment.

Program	NPV	AEV	IRR
CRP	\$876.68	\$51.56	38.31%
WHIP	\$722.72	\$43.68	12.66%

Note: The simulation for CRP was based on a CP3A contract. The CP36 contract will produce higher returns due to a \$100/acre sign up bonus and cost-share rates of 90%. Also, pine straw harvesting is not allowed under the CRP contractual period.

Based on the above numbers, you can see that cost-share programs can have an encouraging response to timber investments. With the help of the CRP, the returns increased above what you can expect from most timber investments. The WHIP scenario had less of a response due to the lack of annual lease payments, but still provided excellent returns compared to similar investments.

Pole Markets

Pole products are typically the most valuable and less variability with stumpage prices among the various pine products. If a pole market exists in your area, managing a longleaf stand to capture this market should be considered. Poles require a straight bole with no evidence of rust or pitch canker and diameters between 12-14 inches. Longleaf pines are excellent candidates and may produce a greater percentage of poles than other southern yellow pines. To produce poles, higher planting densities and pruning may be needed. Stands managed for pole markets usually require longer rotation ages so they are often managed with other objectives such as wildlife and carbon sequestration. Pole markets were not included in the financial analysis of this project.

Carbon Sequestration

Forests sequester carbon and release oxygen into our atmosphere. Longleaf pine has a lifespan of nearly 300 years which makes it a viable option for carbon offset projects that may have long-term contract negotiations up to 100 years.

Assumptions

Management Regime

The above analysis of a traditional longleaf pine regime was created to determine the possible investment returns a landowner can expect from producing traditional forest products. Six scenarios were simulated based on a cutover site in the lower coastal plain of Georgia using site index levels, base age 25, of SI 60 (high-quality), SI 50 (medium-quality), and SI 40 (low-quality). Planting density was based on a 6'x12' spacing (605 trees/acre) and a 90% survival rate was assumed.

All scenarios were thinned twice. The first thinning occurred when the stand reached a basal area of 130 ft²/acre and was thinned again when it reached 120 ft²/acre. Thinning ages varied due to the differences in site productivity. Lower site index levels resulted in later thinnings than higher levels. The rotation ages varied for each site index level and were determined through SiMS2009, basing it on the NPV criterion.

Pine Straw

Pine straw revenue was assumed on a per acre basis and the price was set at \$90/acre. Pine straw was raked for three consecutive years prior to the first thinning of each scenario. Longleaf pine straw is considered the best among the landscaping industry and often brings a premium price. Some cost share programs (such as the CRP) do not allow for straw raking at any point while there is an active rental contract in effect.

Hunting Lease

Hunting lease rates were assumed at \$10/acre/year for the life of the rotation.

Site Preparation and Annual Costs

Site preparation and reforestation costs were assumed at \$368.35/acre. Site prep included a medium chemical spray (\$95/acre), single chop (\$50/acre), and single bed (\$50.00/acre). Seedling prices for 1st generation, containerized longleaf seedling were assumed at \$190/1000 trees with a mechanical planting cost of \$0.08/tree. A spring band spray was included at \$35/acre to control encroaching vegetation. Annual protection and management costs were both assumed at \$2/acre. Annual property taxes were assumed at \$6/acre/year. The analysis assumed planting on a cutover site besides the CRP simulation, which assumes planting on an old field with different site preparation methods and costs. CRP site prep rates were assumed at \$42/acre for scalping, \$38/acre for subsoiling, and the site prep chemical application was assumed at \$95/acre. Seedling and planting costs were the same for all scenarios.

Stumpage Prices

Stumpage prices were assigned to each scenario based on average stumpage price in Georgia from the 1st quarter of 2001 through the 3rd quarter of 2010. Stumpage prices were provided to us from Timber Mart-South.

Pine Sawtimber: \$37.27/ton
Pine Chip-n-Saw: \$22.29/ton
Pine Pulpwood: \$6.99/ton