

**Timber Barons, Taxes, and Technology: From Past to Present, an Examination of how  
Alabama's Lumber History Foreshadowed Current Forestland Ownership Trends**

by

Seth David Hunt

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Approved by

Rebecca Barlow, Chair, Associate Professor, School of Forestry and Wildlife Sciences  
Conner Bailey, Professor Emeritus, Agricultural Economics and Rural Sociology  
John Kush, Research Fellow, School of Forestry and Wildlife Sciences  
Larry Teeter, Professor, School of Forestry and Wildlife Sciences

## Abstract

In the last twenty years the forest products industry has divested most of its forested landbase, and much of this land was in the Southeast. The majority of those divested acres are now owned by real estate investment trusts (REITs) and timberland investment management organizations (TIMOs). This shift in ownership has raised economic and ecological concerns as these new owners have objectives which are often based on short-term revenue generation rather than long-term land management. The introductory chapter provides a review of these changes. The remainder of this thesis, in three parts, seeks to elucidate how landownership changes could be impacting forests and landowners in west-central Alabama. First, an examination of the Kaul Lumber Company provides a historical example of how markets, taxes, and policy issues can have long-term ecological effects. Second, using Landsat imagery and tax parcel records, landownership changes and harvest activity over the last 30 years were identified for the west-central Alabama counties of Bibb, Hale, Pickens, and Tuscaloosa. Third, a survey was conducted to better understand leasing behavior and land management objectives of nonindustrial private forest landowners in the region.

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## **Chapter 1**

### **Introduction**

In the last 25 years, the forest products industry has greatly changed. Traditionally, vertically integrated forest products corporations owned everything from the mills to the land. Today, the forest products industry has divested much of their forestland ownership. This change has given rise to a diverse new group of landowners, the majority of which are real estate investment trusts (REITs) and timberland investment management organizations (TIMOs). Timberland ownership by REITs and TIMOs has been rapidly increasing in the United States. In the early 1980s, the top fifteen largest forestland owners were classified as vertically integrated forest product companies. By 2010, only one of those remained with ten becoming TIMOs and four REITs (Stein, 2011). From 2004 to 2007, industry owned timberland declined by 17.4 million acres while REITs gained 3.4 million acres and TIMOs gained 12.2 million acres (Harris, 2007).

Currently, REITs and TIMOs manage more than 23 million acres of forestland in the United States (Evans and Myers, 2015), with over half of those acres located within the Southeast (Zhang et. al., 2012). This shift in ownership has been evident in Alabama as well. In 2005, Alabama had the second highest in total forested land sale transactions with 2.5 million acres being sold between 1996 through 2004; the only state with more sales was Louisiana (Clutter et al., 2005). This change in ownership has presented a plethora of ecological concerns

regarding land use change, fragmentation, and conservation for the Southeast and Alabama (Block and Sample, 2001; Turner et al., 1996; Clutter et al., 2005).

This thesis, in three parts, seeks to show how landownership changes could be impacting forests and landowners in the counties of Bibb, Hale, Pickens, and Tuscaloosa located in west-central Alabama. The first part offers an examination of the history of the Kaul Lumber Company, a forest products company historically located near the city of Tuscaloosa, on how markets, taxes, and policy, issues can have long-term ecological effects. The second part uses Landsat imagery and tax parcel records to show landownership changes and harvest activity over the last 30 years in Bibb, Hale, Pickens, and Tuscaloosa Counties. The third part consists of a survey conducted to better understand leasing behavior and land management objectives of nonindustrial private forest landowners in the region.

### **Historical Development of the Forest Products Industry within the Southeast and Alabama**

The history of the development of the southeastern forestry industry helps illuminate the departure of forest products industry from its landbase. The decision for this divestment of forest industry were influenced by many of the recurring issues such as product demand, production, taxes, profits, shareholder values, and sustainability that influenced the forest industry of the past.

US census figures for 1840 reported around 31,650 lumber mills nationwide with a total value of their product estimated at \$12,943,507. MacCleery (1993) estimated that this would have been around 25 mills per county for the entire US varying from over 100 mills in the Atlantic states to roughly 10 mills per county in the Midwest and the Southeast. By the beginnings of the Civil War, agriculture dominated Alabama and much of the Southeast, but

forests and related products still contributed greatly to the southern economy. Products such as turpentine, lumber, spirits, rosin, poles, shingles, and timbers had an estimated combined total of \$2,621,241 in value of production (Mohr, 1896). Before the 1880s, most sawmills in Alabama were small-scale and were primarily used for local wood supply. While forest operations were present within the state, they were largely confined to the coast or water systems where manufacturers could easily transport materials or products to markets in large coastal cities like Mobile (Williams, 1980).

Industrial forestry in the South began in the 1880s as many of the timber companies of Great Lakes states relocated to the Southeast when their timber resources were depleted. This began the movement of southern timber harvesting beyond local extraction for everyday living or clearing land for agricultural use. Improvements in technology such as railroads, steam-powered logging equipment, and changes in timber harvesting techniques boosted timber availability and production capabilities (Williams, 1982). With the advent of the railroads in the Southeast, the forest industry thrived. Railroads not only allowed for growing northern markets to consume southern timber goods, but it also allowed forest operations to expand to once inaccessible forestlands (Williams, 1982). In the 1880s, US census figures indicate that there were a total of 25,708 mills reported with a total capital of \$181,186,122 (Fickle, 2014).

By the 1890s, US census figures reported there were 21,911 mills with a total capital of \$496,319,968 (Fickle, 2014). Alabama, much like the rest of the Southeast, was part of this timber boom. Companies/families such as the Kauls (1889), Scotch Lumber Company (1902), McGowins (1905), and T R. Miller (1913) made their start in Alabama during this time and subsequent decades. Harper (1913) noted the close connection between the lumber industry and fundamental geographical conditions within Alabama in 1913 (Table 1.1, Figure 1.1). Regions

such as the Central Pine Belt, Southern Red Hills, and Southwestern Pine Hills had some of the highest capacities of the State where longleaf pine (*Pinus palustris*) and shortleaf pine (*Pinus echinata*) made up the majority of the removals.

**Table 1.1. 1912 Timber Statistics of Alabama Forest Regions as described by Harper (1913).**

Regions	Area (sq. mi.)	Amount of Woodland (percent)	Density of Population (per sq. mile)	Saw Mills	Average Capacity (thousand ft. per day)	Other (Non-Saw Mills) Plants (thousand ft. per day)	Miles of Tram-road	Relative Percent	
								Area	Total Capacity
Tennessee Valley	4900	48	48	52	9	22	10	9.6	5
Coal Region	6400	78	37	42	9.6	6	20	12.6	4.3
Coosa Valley	4000	55	55	69	12	23	23	7.8	8.7
Piedmont Region	5450	57	41	54	7.5	9	10	10.5	4.2
Central Pine Belt	7450	74	36	165	7.5	16	165	14.4	30.2
Black Belt	4300	25	49	22	13.4	6	2	8.4	3.1
Chunnennuggee Ridge	2300	50	41	24	10.4	3	9	4.5	2.6
Southern Red Hills	9635	62	33	95	16.9	7	160	18.7	15.8
Lime-Sink Region	1350	60	50	11	17.5	0	30	2.6	2
Southwestern Pine Hills	5550	80	28	62	37.1	13	424	10.9	24.1
State	51335	62	42	596	16	105	853	100	100



Figure 1.1: Map of forest regions of Alabama as drawn and described by Harper (1913).

Timber production in the South peaked by 1909 and steadily declined until the 1920s and the onset of the Great Depression in 1929 (Fox et al., 2007). Companies with improved efficiencies began to overproduce as prices and demand fell (Massey Jr., 1960). Additionally, the burden of taxation was becoming a major worry in the waning economy (Foster, 1909; Massey Jr., 1960).

Ecologically, the southern landscape had suffered as well. Longleaf pine, which had covered millions of acres along the Southern Coastal Plain had largely been harvested leaving a landscape of agriculture and cut over lands (Frost, 1993). However, beginning in the 1920s and 30s, southern forest management began to shift to a more sustained yield basis (Massey Jr., 1960). Reforestation movements, such as the US Forest Service plantings of the 1920s, the Civilian Conservation Corps of the 1930s, and the Soil Bank Program of the 1950s, ushered in the loblolly pine (*Pinus taeda*) plantations typically found in Alabama today (Fox et al., 2007). The beginning of World War II and trade with European nations would increase the timber demand from the United States. By the 1950s, 60 percent of the Alabama landbase was forested and growth was estimated at three-times the amount of removals (Massey Jr., 1960).

Development of markets would also help drive the forest products industry in the Southeast. During the 1960s and 70s, timber companies conducted aggressive land acquisitions and acquired or constructed many new mills. For example, in the 1960s, Scott Paper Company would acquire roughly 80,000 acres from Vredenburgh Lumber Paper Company and would purchase the Mobile River Sawmill Company. Approximately 10 years later, the Hammermill Paper Company acquired roughly 240,000 acres and built a mill in Maplesville, Alabama (Fickle, 2014). The trend of land acquisition and mill acquisition/construction would remain the status quo until the 1990s.

## **Reasons for Change in the Modern Forest Products Industry**

Beginning in the 1990s, and escalating in the 2000s, millions of acres of forestland were sold off by timber corporations in order to enhance their profitability and to avoid the risk of hostile takeovers as institutional investors aimed for profitability by the way of diversification of large portfolios (Gunnore and Gellert, 2011). This change in ownership of forestland from industry to new ownership, predominately REITs and TIMOs, was precipitated by a combination of reasons.

During this time the forest product industry's weak financial performance resulted in poor shareholder returns (Clutter et al., 2005). Additionally, forest products companies had accrued large amounts of debt to enhance their international competitiveness by way of consolidations (Block and Sample, 2001). This made them vulnerable to hostile takeovers (Gunnore, 2016). Changes in "Generally Accepted Accounting Principles" (GAAP) established reporting methods for all publically traded companies which mandated that trees from an accounting standpoint cannot appreciate or depreciate (Stein, 2011). This meant that for publicly traded timber companies their land was valued the same at time of planting as when harvested after 30 years of timber growth. This practice resulted in an undervaluation of timber assets and reduced returns to investors. Despite these changes in GAAP, the value of timberlands continued to rise due to increased housing production and urban development which allowed the forest products industry to capitalize on the value of their timberlands by selling their landbase (Hickman, 2007). The selling of forestlands, in part, helped to reduce debt, break the trends of weak financial performance, and improve returns (Clutter et al., 2005). This period also began a marked shift away from the philosophy that ownership was necessary to ensure the future availability of raw materials at a reasonable cost (Hickman 2007).



## **Corporation Tax Structure Changes**

In the 1970s and subsequent decades, more efficient tax structures for owning timberland were developed such as the single taxed REITs and S-Corporations (a special type of corporation that can avoid a step of taxation by passing profits to shareholders) compared to the double taxed, traditional C-corporation (corporations that are double taxed but have the ability to reinvest profits at a lower corporate tax rate) (Clutter et al., 2005). One of the benefits of REITs or TIMOs revolves around the idea of gaining tax-exemption or more tax-efficient (meaning to pay the minimum amount of taxes in a given financial process) status, which in return boosts investment value (Mendell et al., 2008). Legislation such as the Employee Retirement Income Security Act (ERISA) of 1974 encouraged institutional investors to diversify their portfolios toward higher-risk investments. The Real Estate Investment Trust Simplification Act (REITSA) of 1997 allowed for REITs to acquire and manage timberland (Hickman, 2007). Additionally, REIT and TIMO structures allow exemption from the reporting requirements mandated by GAAP because they are privately owned entities (Stein, 2011).

### *Real Estate Investment Trusts (REITs)*

Two “attractive” qualities of REITs are their liquidity and tax efficiency (Mendell et al., 2008). In terms of liquidity, REITs are similar to C-corporation timber companies as they both are publicly traded, allowing for easy access and departure in terms of investment. REITs, unlike traditional C-corporations where dividends are taxed twice (once for income tax for the timber company itself and then again to the shareholders), are exempt from income tax allowing for larger dividends to shareholders. Pressure from outside sources pushed some forest industry

companies, such as Potlatch, Rayonier, and later Weyerhaeuser to restructure their C-corporation status to REITs to be more competitive (Mendell et al., 2007).

### *Timberland Investment Management (TIMOs)*

TIMOs were the unintended result of changes in 1970s tax policies that made private, tax-exempt ownership of timberlands more appealing than traditional forest products corporations' ownership of timberlands (Evans and Myers, 2015). TIMOs, unlike REITs, do not have a formal corporate status. Rather it is a commonly used term to describe businesses that operate as third-party asset managers of timberland investments. In this case, the landowner is the institutional investor that may be holding land in a separately managed account and is therefore eligible for a tax exempt status. Whether or not the investor qualifies for tax exempt status depends on the type of entity, but most institutional investors, such as pensions, charitable organizations, foundations, and endowments, are tax exempt. In the case of a pooled fund, such as a limited partnership or private REIT managed by a TIMO, each shareholder would have its own tax status but the TIMO may have to withhold taxes for foreign investors that can later be refunded if the foreign investor is tax exempt per US tax code (Evans and Myers, personal communication, February 19, 2015).

### **Landscape Changes**

The transition of industrial ownership to REITs and TIMOs has caused uncertainty regarding the ecological impact on the forested landscape (Clutter et al., 2005). Where and how much change is occurring? How will their management objectives and silvicultural practices affect the landscape? Will the management practices of TIMOs and REITs lead to increased or

accelerated fragmentation? While the longterm answers to these questions are unclear, Bliss et al. (2008) stated three trajectories of potential land use patterns were common with REITs and TIMOs: 1) intensive timber production forestry, 2) higher and better use (HBU) and parcelization and, 3) conservation easements.

### *Intensive Timber Production Forestry*

Maximizing the financial returns to investors is a major goal of REITs and TIMOs and intensive forest management is the method of choice to achieve their goal (Binkley, 2007). REITs and TIMOs exhibit similar behavior and tend to manage as intensively as industry did historically (Arano and Munn, 2006). TIMOs, similar to large industrial landowners, are typically willing to invest heavily in site preparation and tree planting as well as mid-rotation treatments, chemical releases, and fertilizations (Rogers and Munn, 2003).

In the Southeast, REITs and TIMOs currently own 26% of all planted forests and maintain the highest ratio of acres of planted forests to total acres owned with the remaining 66.5% of southeastern forestlands being privately owned and 7.5% publically owned (Zhang et al., 2012). A majority of these plantations were purchased from the forest industry as they offer better opportunities for intensive management (Rogers and Munn, 2003). The use of intensively managed pine plantations by REITs and TIMOs is expected to increase in the future (Siry and Cabbage, 2001).

Silvicultural and management practices in plantations greatly impact stand development and can greatly influence biodiversity (Carnus et al., 2006). Studies have shown that biodiversity is typically lower in a plantation setting when compared to natural stands (Stephen and Wagner, 2007). For instance, natural longleaf pine ecosystems can have over 150 different species of flora

and fauna within a ¼-acre and contain higher numbers of herbaceous species and greater herbaceous groundcover than loblolly pine or slash pine (*Pinus elliottii*) plantations (Mitchell et al., 2006; Hedman et al., 2006). However, the effects of plantations on biodiversity are highly dependent on the context in which they are found on the landscape (Carnus et al., 2006). Of concern is how plantations contribute to the loss of natural forests through conversion. Another concern is the elimination of habitat for organisms that require particular site conditions (Hartley, 2002). Plantations that replace healthy, natural stands will cause biodiversity to suffer; however, plantations have been used for afforestation of degraded agricultural fields to benefit biodiversity. Therefore, considering the landscape setting on which pine plantations exist and the intensity at which they are managed then becomes important in regards to habitat and biodiversity (Hartley, 2002).

### *Higher and Better Use and Parcelization*

As TIMOs generally work on relatively short (10 to 15 year) timelines (Stein, 2011), there is concern that increases in TIMO ownership will result in more frequent ownership changes and increased fragmentation and parcelization (Wear, 2006). While “traditional” vertically integrated forest products corporations managed their land for the purpose of supplying wood to their mills, TIMOs and REITs are interested in timber production for diversification of investment (Arano and Munn, 2006; Rogers and Munn, 2003). Due to TIMOs and REITs not being bound to the mills but rather to the goal of maximizing financial returns to investors, it has been suggested they may be more willing to convert forestland to other uses (Hickman, 2007).

The Southeast, Maine, and the Pacific Northwest have the highest timber harvest rates in the United States reaching 2-3% of total forest covered removed per year (Masek et al., 2008). In

Maine, TIMOs and REITs bought over 75% of former forest industry lands and maintained very high harvest rates from the 1990s to the early 2000s (Jin and Sader, 2006). Similar trends are expected in the Southeast (Alig et al., 2010). Zhang et al. (2012) showed that TIMOs and REITs in the Southeast are removing twice the amount of hardwood than is annually grown on their lands and suggests that a conversion of hardwood forests to softwood forests is occurring in timberlands owned by TIMOs and REITs. Additionally, despite REITs and TIMOs having the highest reforestation rate of any landowner type, this is primarily in pine plantations (Zhang et al. 2012).

In addition to forest type conversion, it is estimated that some TIMOs generate up to one-third of their total income from real estate sales rather than timber (Binkley, 2007). For the US, forestland accounts for roughly a third of all lands that are subsumed by urbanization (Nowak and Walton, 2005) and the largest influence on wildlife habitat fragmentation has been expansion and intensification of human land use (Andren, 1994). Habitat loss and fragmentation of natural forests has also been linked as one of the main causes of biodiversity loss (Brockerhoff et al. 2008). This loss includes a reduction in available wildlife habitat, an increase in the number of forest patches, a decrease in the size of these patches, and an increase in the distance between these patches (Fahrig, 2003). Subsequently, the implementation of management regimes, particularly clearcutting, on the forested landscape can greatly alter landscape structural characteristics such as patch size, edge length, fragmentation, and configuration (Franklin and Forman, 1987). The positive and negative externalities of these landscape scale changes can be confounding and difficult to interpret.

Forest parcelization or the subdivision of forest tracts into smaller ownerships is also dependent on ownership type (Alig et al., 2010). Due to the short investment timespan and HBU

objectives, TIMOs ownership and management practices may result in more parcelization (Wear 2006). As land holdings are continuously traded, land holdings have the potential to be broken into smaller and smaller land holdings. While parcelization could occur between transfer of land from TIMO to TIMO, this trend could occur as land is acquired by non-TIMO landowners, such as NIPF landowners. For example, NIPF landowners are less likely to have management plans, carry out commercial harvests, or seek certification, or engage in active forest management as land holding size decreases (Butler, 2008). Additionally, landowner death, urbanization, income, regulatory uncertainty, and financial assistance for landowners have been found to have significant impacts on the change in average parcel size in the United States which can lead to further parcelization (Mehmood and Zhang, 2001). Overall, the potential impacts that TIMOs could have on forest parcelization is still not well documented.

### *Conservation Easements*

Conservation easements allow for entities to purchase certain rights restricting how they can alter the property of willing landowners while allowing the landowner to retain certain property rights. Agreements of this type vary with regard to what extent landowners relinquish rights, such as timber, recreational, water, mineral, or development rights, while retaining rights of their choice (Stein, 2011). Landowners can benefit from the sale of these easements or from federal and state tax incentives for donated easements (Massa and Sutherland, 2012). Some REITs and TIMOs have been willing to put their lands in conservation easements. For example, in 2007, Potlatch (REIT) sold a conservation easement for \$6.7 million covering 15,923 acres in Arkansas. Plum Creek (REIT) in 2009 placed 2,000 acres in conservation easements in Florida in return for continuous income for managing the land, development rights credits, and 50 percent

property tax exemption on the land (Massa and Sutherland, 2012). Conservation easements allow for TIMOs and REITs to reduce acquisition costs while maximizing overall investment returns through sale of easements and tax incentives (Hickman, 2007). Interestingly, some have stated that such conservation opportunities through easements were made possible due to landownership changes in the forest industry (Stein, 2011). Others have stated the future use of conservation easements by REITs and TIMOs will likely be small (Block and Sample, 2001). Regardless, it remains unclear what role conservation easements will play in ecosystem service markets and the selling of conservation credits (Massa and Sutherland, 2012).

### **The Southeast, Alabama, and West-Central Alabama**

The Southeast, a region with long reaching and historical ties to forestry and the most productive timber producing region in the world, has seen the largest conversion of forest industry timberlands to REITs and TIMOs ownership (Allen et al., 2005; Clutter et al., 2005). During the early 1980s, the forest products industry owned around 69 million acres of the United States' forestlands and 39 million acres in the Southeast (Smith et al., 2004). As of 2010, it was estimated that REITs owned 7.7 million acres and TIMOs an estimated 8.8 million acres in the Southeast (Zhang et. al., 2012). From 1996 to 2004, a total 18.4 million timberland acres were sold in the Southeast with Alabama having the second largest amount sold at 2.6 million acres (Clutter et al., 2005).

For Alabama, its forests are important economically and ecologically as 70 percent of the state is in forestland. Economically, forest products sales and related sectors totaled \$11.2 billion in 2010 and had an employment impact of almost 320,000 jobs (AU Department of Agricultural Economics and Rural Sociology, 2013). Alabama's forestry industry ranks 2nd in pulp, 3rd in

paper, 7<sup>th</sup> in lumber, and 8<sup>th</sup> in wood-paneling production (Alabama Forestry Commission, 2011). Ecologically, Alabama ranks 5<sup>th</sup> in species diversity in the United States and is the most ecologically diverse state east of the Mississippi River (Stein, 2002).

Although Forest Inventory and Analysis (FIA) data from 1972 to 2013 showed an increase in pine and hardwood forest types' acreage, during the same period Alabama has seen the decline of certain forest types of ecological concern such as longleaf and shortleaf pine. (FIDO, 2014). Longleaf pine within Alabama has continued to decline with much of this loss attributed to the conversion to loblolly pine (Oswalt et al., 2015). Similarly, FIA data from 1980 to 2013 indicated that shortleaf pine in Alabama has seen almost an 80% decline while the Southeast has declined 53% (Oswalt, 2012). Comparably, the proportion of forest land in Alabama in oak (*Quercus spp.*) forest types (7 different oak forest types differentiated by the FIA program) have declined from roughly 30% to less than 10% from the 1989 to 2000 (McShea et al., 2007).

It remains unclear the impact that REITs and TIMOs will have on current and future forest trends but declining forest types coupled with an increasing rate of forest fragmentation (Li et al., 2009) and the fact that just over 50% all land subsumed by urbanization in Alabama is forestland, are reasons for concern (Nowak and Walton, 2005). However, an investigation of current and historic trends can provide insight to what may be occurring at a state-wide or even region-wide scale.

## **Study Area**

In west-central Alabama, an area with a rich forest history, preliminary examinations indicate that large changes in landownership have occurred over the last hundred years. From the



1880s through the 1930s, the Kaul Lumber Company, one of the most prominent forest industry companies of its time, oversaw major forest landholdings. While within the last ten years, companies such as International Paper, a formerly vertically-integrated forest products company which was prevalent in Tuscaloosa County and the surrounding areas, sold the majority of their landbase between 2006 and 2008.

The counties of Tuscaloosa, Bibb, Hale, and Pickens offer diversity in the presence of forestry industry and population demographics while encompassing multiple geographic regions and forest types. Conservation programs such as the Forest Legacy have placed high conservation priorities on Bibb (Priority 1), Hale (Priority 2), and Tuscaloosa County (Priority 2). These priorities were set to help protect ecosystems such as dolomite glades, Fall Line Hills longleaf pine forests, and riparian corridors and associated forested wetlands along rivers such as the Sipsey River and Cahaba River to the growing human pressure on these biodiversity “hotspots” (Boyce et al., 2002). Pickens County is also of interest as it one of the highest timber producing counties in Alabama.

## **Research Objectives**

While some studies such as Zhang et al. (2012) and Butler and Wear (2011) that have addressed REITs and TIMO ownership on a larger scale, generalized trends may not be indicative of changes with certain types of landowners particularly at a more local level (Harris and Deforest, 1993). In fact, several studies illustrate that this restructuring has occurred at various intensities on a local scale (Randle et al., 2015; Ameyaw, 2013; Jin and Sader, 2006; Acheson, 2008). However, to better understand the effect that REITs and TIMOs have on the

forested landscape more studies are needed (Noone et al., 2012; Hickman, 2007; Clutter et al., 2005).

The use of property tax assessor data has been shown effective in documenting landownership changes (Kittredge et al., 2008; Randle et al., 2015). Landsat satellite imagery has also long been used for monitoring the forested landscape and is an accurate and effective way to document landscape changes (Cohen and Goward, 2004; Jin and Sader, 2006). Incorporating both with the use of property tax assessor data with satellite imagery could provide a way to accurately identify what landscape changes are occurring and if they are associated to REITs and TIMOs (Jin and Sader, 2006). Therefore, linking landscape disturbance with forested landownership could provide insight to changes not only in regard to landownership but also the current and potential impacts associated with these ownership changes (Jin and Sader, 2006). Using these tools, this project will examine ownership changes from forest industry to other landowners, particularly REITs and TIMOs, in the west-central Alabama. In addition to assessing how forestland has changed in ownership over the last 30 years, this thesis examines the potential impacts of these landownership and management changes in the region in three separate studies.

1. The first study (Chapter 2) uses the Kaul Lumber Company to provide a historical example of landscape changes, financial struggles, and taxes associated with the forest products industry within west-central Alabama at the turn of the last century. The history of Kaul Lumber Company and Kaul Land and Lumber Company in conjunction with ecological landscape changes, disposition to management, and tax laws mirrors some of the current discussion associated with REITs, TIMOs, and a changing forestry industry of today. Using historic documents and deeds of the Kaul

Lumber Company and Kaul Land and Lumber Company, the historical landbase of the Kaul Company was also re-created.

2. The second study (Chapter 3) examines the land ownership change of industry owned timberland from the late 1980s and early 1990s to 2014. Using Landsat 5 and Landsat 8 imagery, timber harvesting behavior patterns are examined in Bibb, Hale, Pickens, and Tuscaloosa County over a 30-year period. A spatial database was created of industrial ownership occurring in Bibb, Hale, Pickens, and Tuscaloosa County, which linked attributes such as current ownership, past ownership, and date acquired to harvesting data to gauge how change in landownership has affected harvesting patterns in the study area.
3. The third study (Chapter 4) consists of the results of a survey sent to non-industrial private forest (NIPF) landowners in the study area of Bibb, Hale, Pickens, and Tuscaloosa Counties. As forest industry has divested its landbase, the remaining forest industry has become more dependent on timber sources from NIPF landowners. In addition to questions of management, this raises the question of the potential impacts of timber leases associated with NIPF landowners. This survey inquired about acreage, ownership type, forest type, management objectives, as well as timberland leasing arrangements.

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## **Chapter 2**

# **Of Longleaf and Taxes: the Kaul Lumber Company's Shaping of the Alabama's Forested Landscape**

### **Abstract**

As one of Alabama's earliest "industrial" forest landowners, the Kaul Lumber Company operated the pioneering Kaulton mill and owned approximately 107,000 acres of forestland in the Central Pine Belt during the late 1800s and early 1900s. This rise to power would be short-lived, however. A combination of unfavorable tax legislation, changes in public perception, overharvesting, and The Great Depression caused the Kaul Lumber Company to divest most of its land base and the Kaulton Mill cease operations by 1931. More recently, "modern" forest industry actors have also begun to divest themselves of much of their land base. Driven by factors similar to those that affected the Kaul Lumber Company, contemporary industrial forest landowners have sold or transferred much of their property. This paper offers a historical account of how the influence of changes in society, changing markets, and tax law impacted the Kaul Lumber Company and Alabama forestry over 100 years ago and compares how these factors continue to influence today's forest industry.

## Alabama's Early Forest History

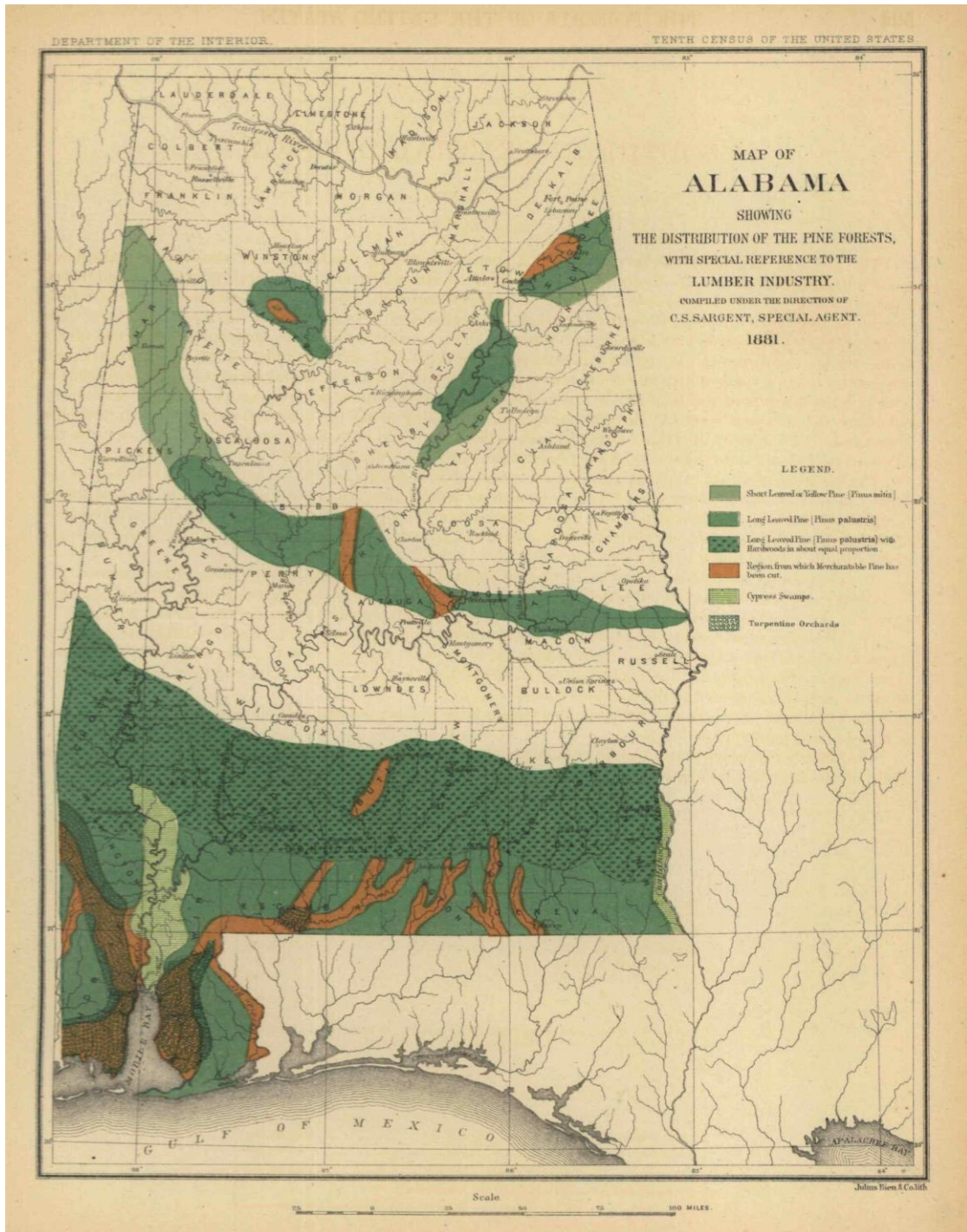
Some of the earliest accounts of Alabama's forests date back to 1791 when William Bartram, a botanist from Pennsylvania, first described the state's forests, "This plain is mostly a forest of the great long-leaved pine (*P. palustris* Linn.), the earth covered with grass, interspersed with an infinite variety of herbaceous plants, and embellished with extensive savannahs, always green, sparkling with ponds of water..."<sup>1</sup> These forests were maintained by regular, low-intensity fires on intervals of one to ten years. These fires were often the result of lightning strikes or burning by indigenous peoples, and were key to maintaining the forest structure of an herbaceous understory with scattered shrubs and an open-canopy.

As European settlers migrated to the US South in the mid-1700s, they were confronted with vast forests of longleaf pine which was, in fact, highly desirable as a timber tree because of its long, straight bole and high quality wood.<sup>2</sup> To utilize this resource, pioneers established water-powered lumber sawmills on dammed streams alongside, or as part of, gristmills.<sup>3</sup> Initially only the forests near rivers and streams were harvested as timber from these areas could be transported relatively easy by oxen or floated downstream to these creek-side mills. Small communities grew up around the mills which produced planks, shingles, clapboards, barrel staves and shipbuilding parts.

By the 1840s, Alabama was reported to have had 524 sawmills with a capital investment of \$1.4 million and employing 1,386 men.<sup>4</sup> Many of these mills were destroyed in the Civil War, but were later rebuilt by prominent families/landowners who would begin major operations in south Alabama during this time.<sup>5</sup> For example, in 1876 Elisha Downing and Daniel W. Goodwin built a new mill on Cedar Creek in Escambia County, Alabama that had a 60 horse-power water-driven circular saw that was said to have been "the best of its kind in the country".

Three years later the Blacksher Brothers would build a small mill near Brewton, Alabama. They were said to have acquired timberland to harvest through barter. Forty acres of virgin longleaf was obtainable for 3 sacks of corn, a 10 lb. caddy of tobacco, three sides of bacon, one barrel of flour, 40 lbs. of coffee, with the offer of additional corn and coffee for good timber. Also during this time Napoleon Dixon and his father Wiley B. Dixon would establish a sawmill on the banks of Blue Creek in Conecuh County, Alabama where they would then float the logs down the Conecuh River to Pensacola, Florida.<sup>6</sup>

The 1880 US Census of Manufacturers reported that the best pine in the country was being gathered from the banks of streams in the southern part of Alabama (Figure 2.1).<sup>7</sup> The 1880s also marked the departure of the timber industry from the Lake States of Illinois, Indiana, Michigan, Ohio, and Wisconsin and the Middle Atlantic states of New York, Pennsylvania, and New Jersey where the majority of the virgin white pine (*Pinus strobus*) and red pine (*Pinus resinosa*) forests had been consumed. During this time, little thought was given to regenerating harvested forests, so an alternative was needed to replace this depleted resource. Northern investors were attracted to the seemingly endless forests of longleaf pine in the US South, so, they set their sights on southern states like Alabama.<sup>8</sup>



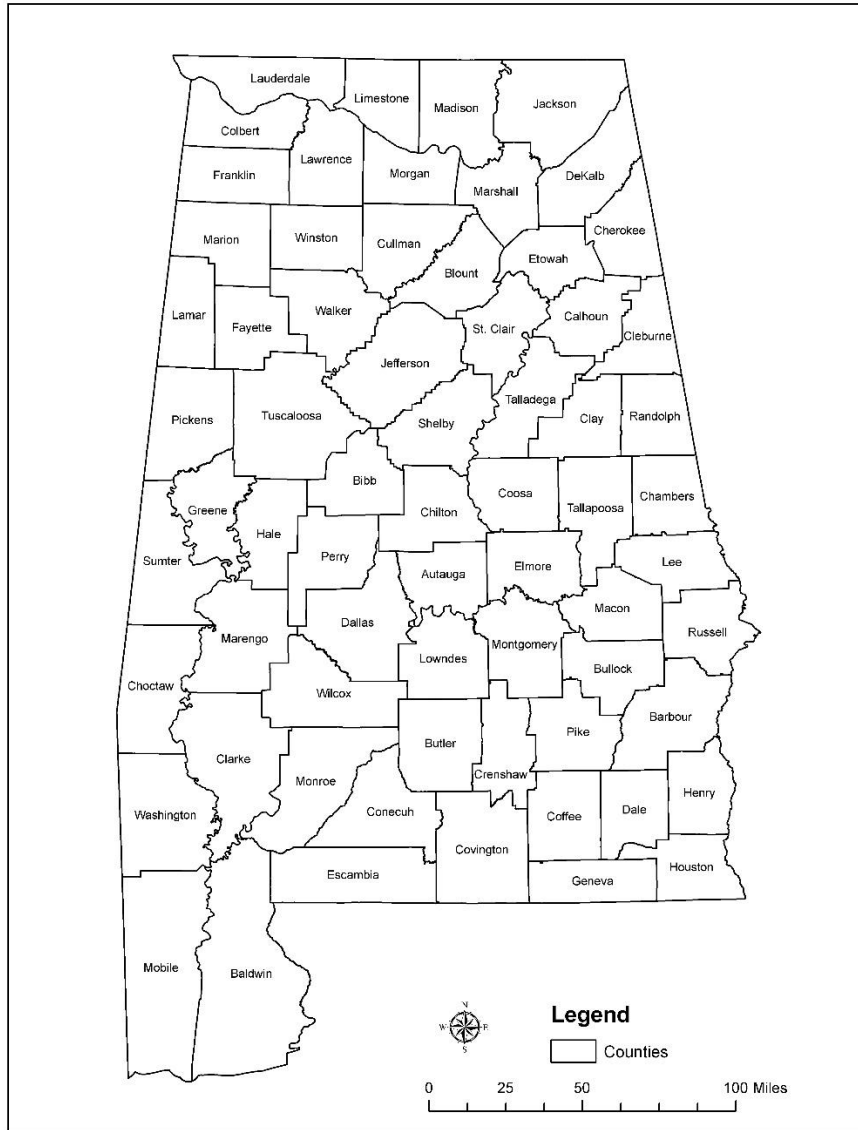
**Figure 2.1. Forest distribution of pine forest and industry activity as of 1881 in Alabama as described by C.S. Sargent.**

At the same time, the U.S. government was more than willing to sell large amounts of land at undervalued prices to these eager buyers. The repeal of the Southern Homestead Act of

1866 in 1876 made public lands in the Southeast subject to speculation by timber investors.<sup>9</sup> This change allowed companies to purchase large, contiguous blocks of virgin forests which they would access with newly improved railroad infrastructure. One of these investors was John Kaul.

### **The Establishment of the Kaul Lumber Company in Alabama**

In 1889, John Kaul left his father's lumbering business in St. Marys, Pennsylvania, to seek investment opportunities in Alabama. John Kaul had learned the timber business from his father, Andrew Kaul, who served as president of the Penn Lumber Company which marketed timber goods in Pennsylvania and neighboring states for more than ten lumber mills and associated landowners.<sup>10</sup> In 1889, John Kaul and his father would buy part interest in the Sample Lumber Company in Hollins, Alabama which had timberland in Clay and Coosa Counties (Figure 2.2). The timber industry in Alabama had begun to expand into central Alabama as other families such as the McShans, Melroses, and the Belchers begin or increased operations in this region where longleaf pine continued to be the timber tree of choice. Botanist Charles Mohr stated of the region, "The Longleaf Pine is the tree of widest distribution and of greatest commercial importance in the southern Atlantic forest region of eastern North American, covering, with scarcely any interruption; areas to be measured by tens of thousands of square miles and furnishing useful material."<sup>11</sup>



**Figure 2.2: Counties of Alabama.**

John Kaul and his father would buy out the remaining Sample stockholders in 1902 and rename the Sample Lumber Company the “Kaul Lumber Company”. At the same time, John Kaul also incorporated the Kaul Land and Lumber Company which would buy and sell landholdings in Bibb, Hale, Tuscaloosa, Perry Counties (Figure 2.2). Reports and lumberyard inventories from the Kaul Lumber Company showed that a majority of removals were longleaf

and shortleaf pine (*Pinus echinata*) while hardwoods, such as yellow poplar (*Liriodendron tulipifera*) and oaks (*Quercus spp.*), played a smaller role.<sup>12</sup> The Kaul Lumber Company business catchphrase, “Long Leaf Timbers, Short Leaf Finish” represented primary products of their mill.<sup>13</sup>

In 1905, Franklin Reed, a forest assistant with the U.S. Forest Service, worked with the Kaul Lumber Company to develop a forest management plan that would promote a natural regeneration for a second timber harvest as both entities had seen the end result of over-harvesting in the Lake States.<sup>14</sup> Reed extensively mapped and inventoried 30,000 acres of the Kaul Lumber Company forestland in Coosa and Clay Counties and 70,588 acres of the Kaul Land and Lumber Company forestland in Bibb, Hale, Perry, and Tuscaloosa Counties where he would classify the Kaul’s forestland into “longleaf pine land” and “creek land”. Over 80% of Kaul Company forestland was classified as “longleaf pine land” which was primarily stocked with longleaf pine and to a lesser extent shortleaf pine and upland oaks (Figure 2.3, Figure 2.4). In the “creek lands”, loblolly pine (*Pinus taeda*), various oak, sweetgum (*Liquidambar styraciflua*), and yellow poplar grew in the clay soil valleys. At the time loblolly pine was regarded as in “inferior” tree to longleaf and shortleaf pines. Sargent stated that loblolly or “old field pine was, “...springing up on all abandoned lands from Virginia southward and now often replacing in the southern pine belt the original forests of *Pinus palustris*” and was “largely used for fuel and manufactured into lumber of inferior quality.”<sup>15</sup>

Reed would ultimately suggest to increase the size of the timber that should be harvested to ensure a second crop. Common harvest practices dictated that trees should be a minimum of 15 inches in diameter at 4.5 feet above the base, or diameter breast high (DBH), due to wood utilization technology and limited cost-benefit of removing smaller trees. Reed proposed that



Kaul should harvest only longleaf pine trees that were at least 18 inches DBH and loblolly and shortleaf pines that were at least 14 inches DBH.<sup>16</sup>

Dr. Hermann Chapman, a professor at the Yale School of Forestry, also traveled through the Southeast in the early 1900s visiting several timber companies with his forestry students. Chapman and his students worked with the Kaul Lumber Company in 1908, where he stressed the importance of and need for regenerating forests. Research at the time was beginning to show that harvesting only larger trees often did not leave enough timber to adequately regenerate a forest stand and was “not good business”.<sup>17</sup> Despite recommendations by experts like Reed and Chapman, regenerating the land was rarely practiced. As forestland was readily available, very few people actually saw the value in retaining it or regenerating it.

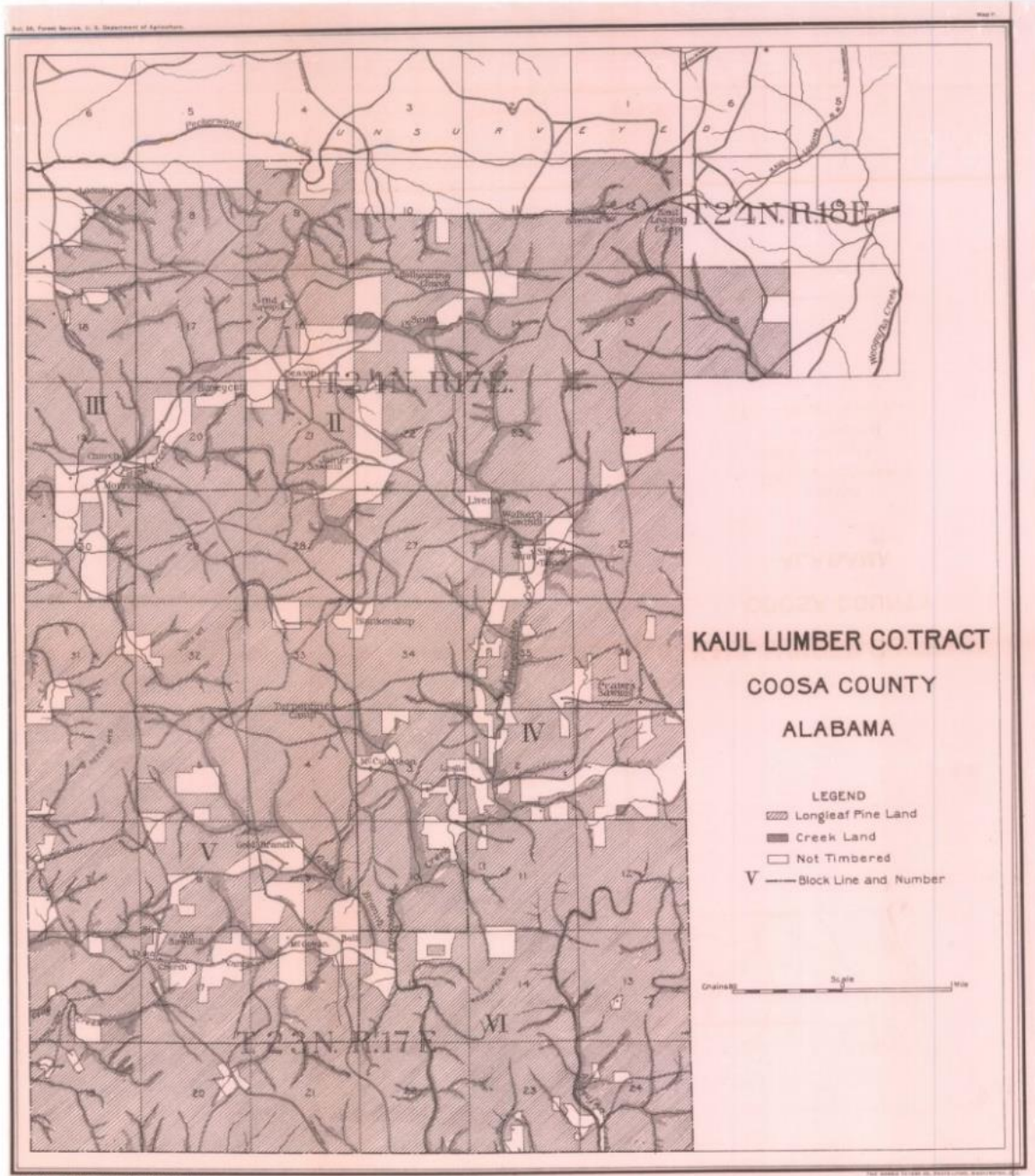
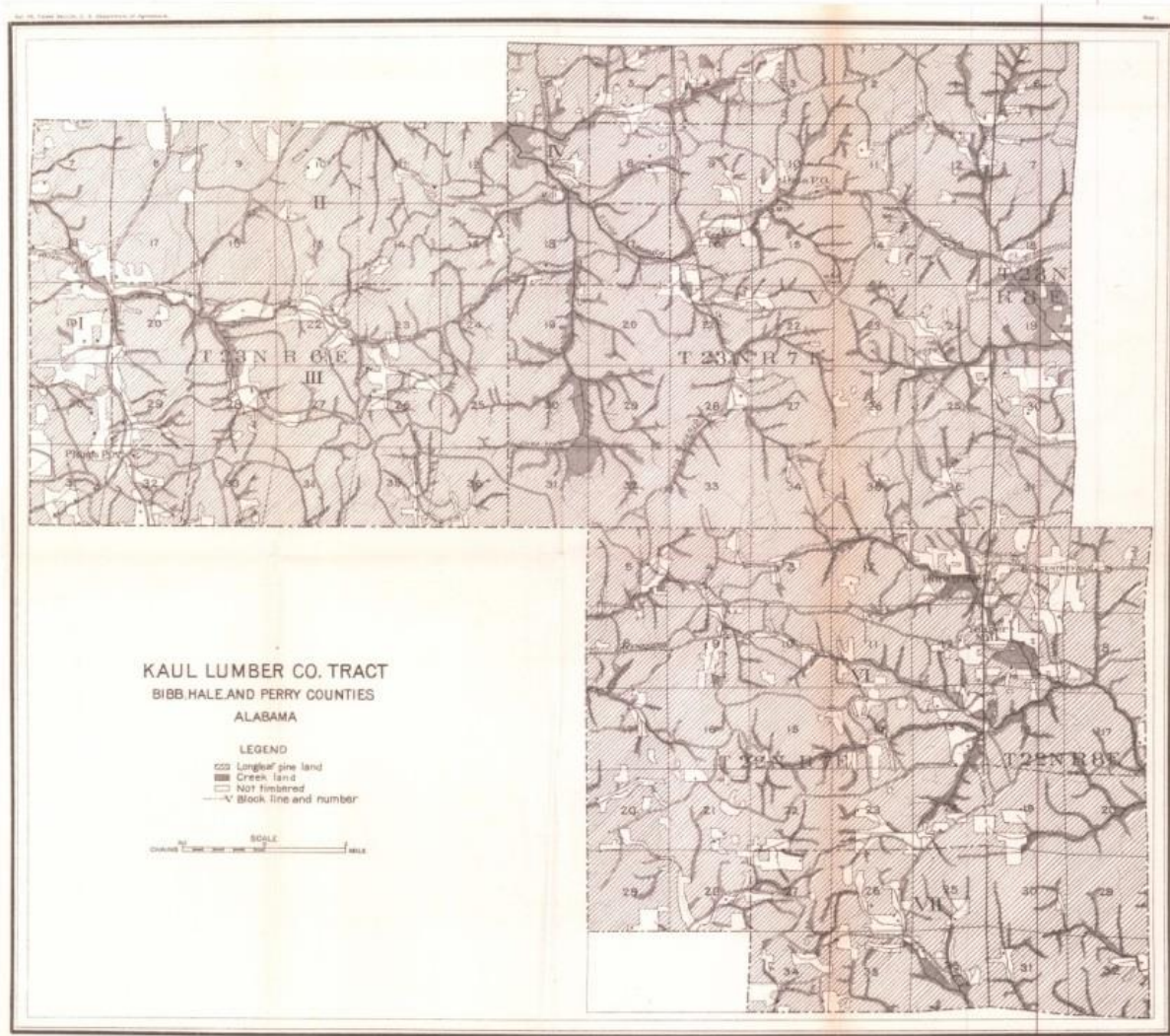


Figure 2.3. Description of forested lands of the Kaul Lumber Company located in Coosa County, Alabama as drawn by Reed in 1905.

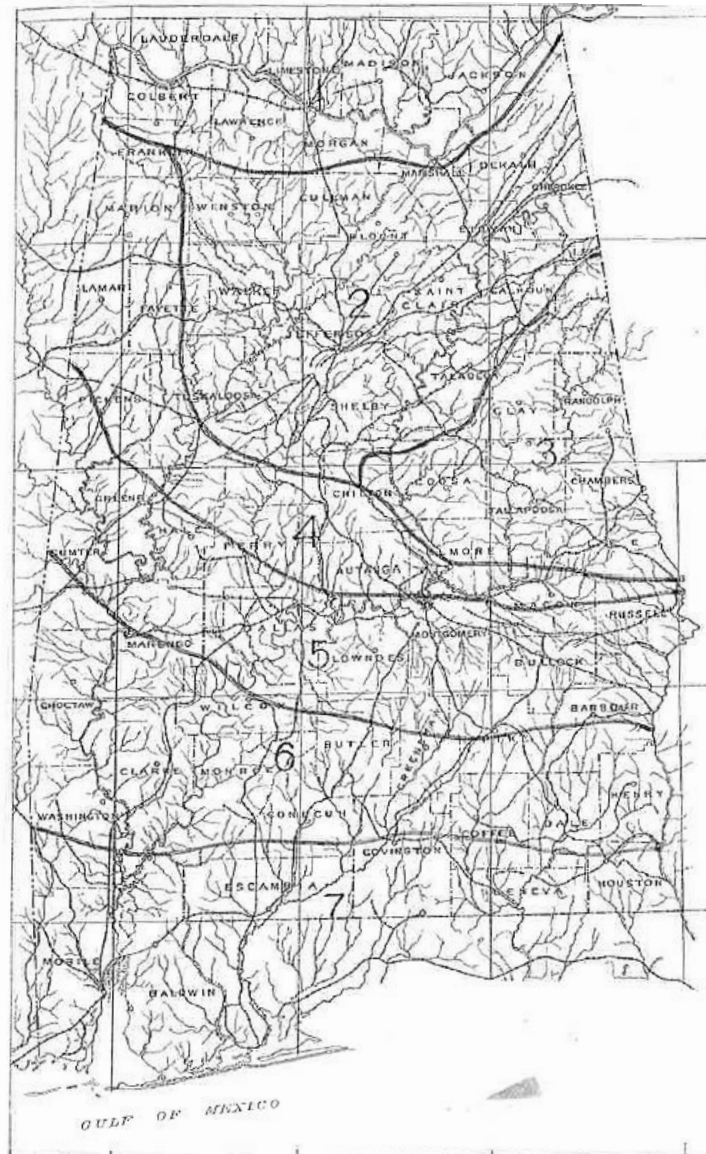


**Figure 2.4. Description of forested lands of the Kaul Lumber Company located in Bibb, Hale, Perry County, Alabama as drawn by Reed in 1905.**

### **Shifting Markets, Taxes, and the “Slough of Despond”**

By 1909, timber production in the southeastern United States was at an all-time high and the Kaul Lumber Company was one of its leading forest products companies.<sup>18</sup> That same year Kaul made the decision to close the original mill in Hollins, Alabama and relocate operations near present day Tuscaloosa, Alabama to capitalize on the largely untouched stands of longleaf pine in the Central Pine Belt physiographic region (Figure 2.5).<sup>19</sup> As much of the rest of the state had already been cut over or was being harvested, timber operations began to shift to the Central

Pine Belt which now had the largest production capacity and more mills than in any other region in the state.<sup>20</sup> John Kaul would build not only a state-of-the-art mill in this location, but also a planned mill town, Kaulton, that was hailed as a model for future community development.<sup>21</sup>



**Figure 2.5. Forest Regions by J.H. Foster. Each region corresponds as such: 1) Tennessee Valley Country, 2) Coosa Valley and Coal Measures, 3) Piedmont or Crystalline Region, 4) Central Pine Belt, 5) Prairie or Agricultural Region, 6) Upper Coast Pine Belt, 7) Lower Coast Pine Belt.**

Soon thereafter, timber markets began to decline as a result of mounting lumber surpluses. Some landowners began expressing concerns regarding a lack of profitable markets

for their timber products.<sup>22</sup> Timber companies began to shift their focus to European markets with the advent of War World I and subsequent reconstruction with little luck. Although, European markets would offer some respite to the overproduction, waning markets still plagued southern lumber companies.<sup>23</sup> Additionally, the American public was beginning to take note of the now dwindling Southern forests as the result of a surging conservation movement.<sup>24</sup>

Chapman would again weigh in on the management of forests writing, “The present policy of most holders of stumpage in the South is clear cutting, which is followed by accidental or intentional broadcast burning of the slash, and sale of the land to settlers or land companies; and this is attempted in spite of the fact that there is at present no urgent demand for much of this pine land and that these timber companies still have ten to thirty years’ cut in sight.”<sup>25</sup>

The conservation of timber, while desired, was difficult to sell due to the state of timber markets and prices. John Kaul would write, “As is true of the heavily wooded regions of the United States, it is probably the fact that lumbering operations in Alabama were begun at least a generation too soon, and at a time when supply of good timber was so plentiful that it had very little value; this led to wasteful cutting, only the cream of the timber being taken and in fact, by far the greater part of the tree itself in many cases being left to decay in the woods. This makes the conservation of the remaining timber supply, through the full use of the individual tree, all the more important.”<sup>26</sup>

Likewise, concerns of taxation were being raised as lumber demand began to decline. Gifford Pinchot, who served as the first head of the U.S. Forest Service from 1905 to 1910, would write that low stumpage prices, lower profits in forestry compared to other investments, the desire for quick returns rather than long-time investments, and the influence of destructive forest fires posed problems for forestry. However, the most serious obstacle for forestry at the

time according to Pinchot was the “faulty” system of forest taxation.<sup>27</sup> Taxes, in part, helped influence the “cut out and get out” mentality that subsequently shaped the southern landscape. Regeneration of forestland was rarely considered because property tax laws heavily favored non-forested lands at a ratio as high as 10:1 in some of the southern states.<sup>28</sup> Even as late the 1930s, the philosophy of forest regeneration would face staunch opposition as some would argue the higher and better use of land rarely nodded towards forestry. During this time, even John Kaul would defend the practice of the use cut over lands for agriculture. “The cut over lands of the state offer great opportunities for the future, for there is available almost any kind of soil that may be desired, well watered and well wooded, with climatic conditions most favorable to farming operations. Diversified farming and stock raising, on the fresh lands cleared by the lumber operator, will in the future engage the attention and energies of the farmer who in the years past, thought only cotton.”<sup>29</sup>

While some attempts were made to offer tax relief to southern landowners, these efforts were largely unsuccessful and of little impact.<sup>30</sup> Alabama would pass a law in 1907 with the formation of the Alabama Forestry Commission (AFC) that allowed landowners, with land assessed at a value that did not exceed 5 dollars per acre, to make a contract with the AFC to manage their property. These contracts outlined how landowners should grow and maintain timber trees, under the direction of the AFC, for ten years. As a result, landowners gained a tax exemption for the land during the period of the contract.<sup>31</sup> Initially there were a number of applications to the program, but after two years the AFC had failed to act upon any of them. Success of this program was also hampered by the fact that most landholders were wary of contract requirements and potential impacts on their land. Additionally, legal stipulations largely

exempted lands that had been conservatively harvested and that were worth more than five dollars per acre after the harvest.<sup>32</sup>

Growing concerns of the American public regarding the dwindling forestry supply and the state of its forests would result in legislation such as the Capper (1921) and Snell-McCormick bills (1921). The Capper Bill, backed by Gifford Pinchot, was introduced to the United States Senate on the 2<sup>nd</sup> of May, 1921 by Senator Capper, an influential Senator from Kansas. Its purpose was to establish standards for the forestry industry in each geographic region in the United States. It proposed mandatory rules for production accounting, development of mandatory standards for reforestation, harvesting and fire protection, and a severance tax for each 1000 board feet produced. The Snell-McCormick Bill was viewed as a “watered down” version of the Capper Bill in that it lacked exactly how regulations would be determined.<sup>33</sup>

John Kaul, who had continued to rise in influence, now served as director of the American National Lumbermen’s Association and was a member of the AFC.<sup>34</sup> He spoke to National Lumberman’s Forestry Committee, of which he was a chairman, expressing concerns about the Capper and Snell-McCormick bills, and concerns of timberland landowners. He stated that while the intentions of the bills were good, they were neither feasible nor practical and that current tax systems were unjust for timberland owners.<sup>35</sup> “The matter (of forestry) is purely one of practical economics, so far as the individual citizen is concerned, whether he be timber owner or lumber consumer. The business of conserving timber or growing timber is just like any other – if it costs more than it produces, it falls.”<sup>36</sup>

Land management was viewed as a “business of great variety and hazard”. Those who had the capacity to engage in active land management had no incentive to do so, as a profit (in the short run) could not be made.<sup>37</sup> Growing ever more concerned about the state of the industry,

John Kaul would write in an unaddressed letter, “The forest products industry is in the Slough of Despond, harassed by heavy timber investments and increasing carrying charges. Faced with growing overproduction, it has not adequate machinery or legal authority to meet the situation. Profits are meager; and public pressure for drastic regulation of private timber cutting surges intermittently, influenced often by agencies as ill-advised as the most reactionary timberland owner.”<sup>38</sup>

### **Income Tax and Section 220 of the Revenue Act of 1924 and Revenue Act of 1926**

With the passing of the Corporate Excise Tax of 1909 and the Sixteenth Amendment, Congress was given the power to lay and collect taxes on incomes.<sup>39</sup> The corporate income tax would increase from 1% to 12% in within a decade (Table 2.1). However, before 1924 a tax payer could largely “avoid” income tax by creating trust with the right to revoke the trust in favor of himself.<sup>40</sup> As an example, the Kaul Lumber Company, already established St. Mary’s Trust which would, in part, serve this purpose.



**Table 2.1. Corporate income tax rate in the United States from 1909 to 1937<sup>41</sup>**

Year	Taxable Income Brackets	Rates (percent)
1909 - 1913 (February 28)	First \$5,000	--
	Over \$5,000	1
1913 (March 1) - 1915	All Taxable Income	1
1916	All Taxable Income	2
1917	All Taxable Income	6
1918	First \$2,000	--
	Over \$2,000	12
1919-1921	First \$2,000	--
	Over \$2,000	10
1922-1924	First \$2,000	--
	Over \$2,000	12.5
1925	First \$2,000	--
	Over \$2,000	13
1926-1927	First \$2,000	--
	Over \$2,000	13.5
1928	First \$3,000	--
	Over \$3,000	12
1929	First \$3,000	--
	Over \$3,000	11
1930-1931	First \$3,000	--
	Over \$3,000	12
1932-1935	All Taxable Income	13.75
1936-1937	First \$2,000	8
	Over \$2,000, not over \$15,000	11
	Over \$15,000, not over \$40,000	13
	Over \$40,000	15

Andrew Mellon, the Secretary of the Treasury from 1921 to 1932 would crusade for tax cuts in 1920s to reduce the hefty taxes that had been implemented by President Woodrow Wilson during World War I. He argued that high tax rates failed to raise money but rather promoted legal tax avoidance, illegal tax evasion, and overall reduced revenue via taxes.<sup>42</sup> Subsequently, many of the acts Mellon supported would lower tax rates and alter tax laws while trying to remove loopholes in an effort to ensure that taxes would actually be paid.

For the Kaul Lumber Company, and many others of the time, the Revenue Act of 1924 and 1926 were of particular concern. Within both of these acts was the controversial Section 220, which ended the individual surtax evasion.<sup>43</sup> Section 220 of the Revenue Act of 1926 stated that

if any corporation, for the purpose of preventing the imposition of the surtax upon its stockholders, permitted its gains and profits to accumulate instead of being divided or distributed it would be subject to a tax of 50% of its net income in addition to the regular corporation income tax due. This was to prevent a corporation from accumulating gains or profits beyond the “reasonable needs of the business” to escape the surtax.<sup>44</sup> Additionally the law would state “that if any corporation, however created or organized, formed or availed of for the purpose of preventing the imposition of the surtax upon its shareholders through the medium of permitting its gains and profits to accumulate instead of being divided or distributed, there shall levied, collected and paid each taxable year upon the net income of such corporation a tax equal to 50 per centum of the amount thereof, which shall be in addition to the tax imposed by section 230 of this title”.

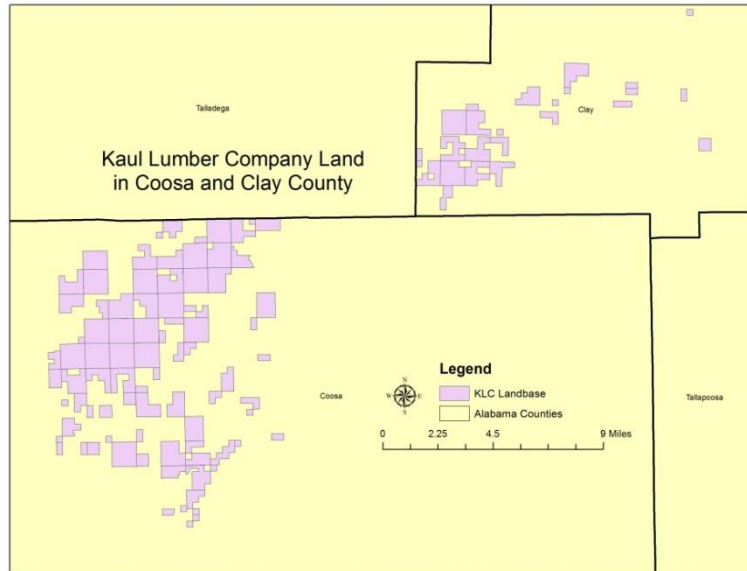
Section 220 was, by all accounts, poorly defined. For example, many questioned terms such as “reasonable needs of the business”. The section, in fact, was so disconcerting that the constitutionality of the section itself was questioned.<sup>45</sup> Historic records show that the Kaul Lumber Company was directly impacted by this change. A letter to John Kaul from the Bradley, Baldwin, All & White law firm dated April 13, 1927 explained that the Kaul Land and Lumber Company had accumulated \$1,500,000 in cash and securities, but due to the Revenue Act of 1926 the company would have a taxable surplus of \$764,000. The Kaul Lumber Company had also accumulated a surplus of \$3,328,000 which would likewise be subject to this tax.<sup>46</sup>

However, a loop hole was discovered with this new law; it was now more efficient to pay taxes on a new company than an old one.<sup>47</sup> Therefore, a corporation could create a new company, transfer assets from the old company to the new one, and pay a lower tax rate, and receive benefits while operating as a “foreign entity”. On the advice of Bradley, Baldwin, All &

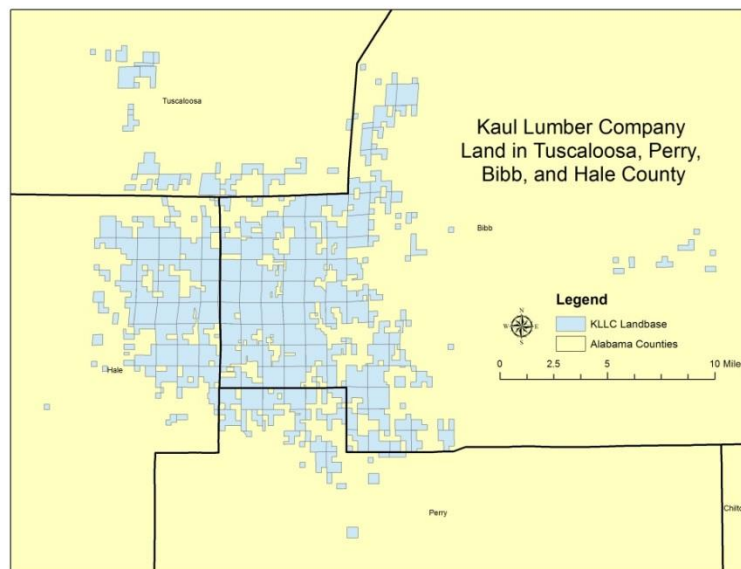
White, the Kaul Lumber Company and the Kaul Land and Lumber Company would take this course of action. In 1927, the “Kaul Lumber Company” and the “Kaul Land and Lumber Company” corporations were created in Delaware. Roughly 107,000 acres of the combined Kaul Lumber Company and the Kaul Land and Lumber Company’s lands and operations were then “sold” to the newly created Delaware based firms (Figure 2.6, Figure 2.7). While Kaul management had originally had considered Florida as a home for the new corporations, they instead settled on Delaware, a state historically favorable to firms. An example of how David Himmelblau, a professor from Northwestern University, outlined this process as way to bypass the surplus tax in 1927 follows:<sup>48</sup>

1. A Wisconsin corporation revalued its properties and credited the excess of the appraisal value over the ledger figures to surplus.
2. The entire surplus arising from earnings as well as from the appraisal was distributed through the medium of a stock dividend.
3. A Delaware corporation was organized.
4. A plan of reorganization was prepared.
5. The stockholders of the Wisconsin corporation exchanged their shares for stock in the Delaware corporation.
6. The assets of the Wisconsin company were transferred to the Delaware company in exchange for stock thus effecting a merger of the two companies
7. The Wisconsin corporation was dissolved.
8. A stock dividend and a change in domicile.
9. The individual stockholders of Wisconsin corporation, having received Delaware stock in exchange for Wisconsin stock in connection with a reorganization, have realized neither gain nor loss. Hence there is no Federal liability. Had the stockholders received cash or other property in addition to the new shares the situation would be more complicated.
10. The Wisconsin corporation realizes neither gain nor loss by distributing its assets to Delaware corporation in liquidation, hence there is no Federal tax liability.
11. The Delaware corporation, upon receipt of the net assets of the Wisconsin corporation through a liquidating dividend, realizes neither gain nor loss because the value of the assets received does not exceed the cost of the stock surrendered, the latter being identical with the par value of its own stock which was issued to acquire the Wisconsin stock. Even though there was a profit there would be no Federal tax liability.
12. Wisconsin state income taxes will be levied on—
  1. The stock dividends received by Wisconsin residents except to the extent the corporation paid income tax thereon.
  2. Profits of the Delaware corporation earned in Wisconsin.

- Dividends received by Wisconsin residents from the Delaware corporation to the extent no Wisconsin income tax was paid thereon.



**Figure 2.6. Kaul Lumber Company Land in Coosa and Clay County as of 1927 that was sold to the Kaul Delaware corporation by the Kaul Alabama corporation in an effort to avoid additional taxes that were the result of the Revenue Act of 1926.**



**Figure 2.7. Kaul Lumber Company Land in Coosa and Clay County as of 1927 that was sold to the Kaul Delaware corporation by the Kaul Alabama corporation in an effort to avoid additional taxes that were the result of the Revenue Act of 1926.**

## **The End of an Era**

However, reorganizing the corporation and selling the land to themselves would offer only a brief respite, as the Great Depression was looming. Within the forest industry, unfavorable taxes coupled with product overproduction and low prices continued to cause concern. By 1927, letters between members of the Kaul Lumber Company Board would indicate that only 4 to 7 more years of timber harvests were left on their property.<sup>49</sup> To overcome this deficit, the company looked into purchasing land in areas such as Florida, Arkansas, and even as far away as the redwood forests of California.<sup>50</sup> Minutes of the meetings in the final years of the Kaul Lumber Company consistently expressed fears and concerns over potential taxes and forest regulation policies.<sup>51</sup> After John Kaul's untimely death in 1931, Hugh Kaul, John's son, oversaw the dissolution of the Kaul Land and Lumber Company just two years after the start of the Great Depression.<sup>52</sup> The Kaulton mill would never again produce lumber, and the Kaul family would begin selling timber rights and real estate.

As part of the land sale process, the Kaul Lumber Company had much of the property inventoried by a forester named George Drolet in the early 1930s. Drolet provided estimates of timber volumes in thousand board feet (MBF) for each 40 acre block in the proposed land sale. His inventories showed that while some portions of the property still retained native longleaf and shortleaf pines other areas had regenerated back to loblolly pine which had seeded in from adjacent bottomland areas.<sup>53</sup>

In the 1920s and 30s, after a half a century of Kaul era harvesting and management practices, southern forest management began to shift yet again to what was hailed as a "sustained yield" basis.<sup>54</sup> Changes in conservation and reforestation were being slowly being realized.<sup>55</sup> Reforestation movements such as US Forest Service plantings of the 1920s, the Civilian

Conservation Corps of the 1930s, and the Soil Bank Program of the 1950s ushered in loblolly pine plantations typically found in Alabama forests today.<sup>56</sup> By the 1950s, 60 percent of the Alabama landbase was forested and growth was estimated at three-times the amount of removals.<sup>57</sup> But the historic, natural longleaf pine forests were all but lost.

Longleaf's irregular seed production and slower initial growth made it more difficult to regenerate, so instead land managers often turned to the faster growing and more readily available loblolly pine.<sup>58</sup> Fire exclusion policies of the 1930s and 40s also impacted natural regeneration of the fire dependent longleaf ecosystem. Woodland fire helped reduce competition and created suitable soil conditions for seed establishment. However, concerted efforts to remove fire from the landscape instead promoted the natural regeneration of less fire tolerant, pioneer species like loblolly. By 1946, longleaf pine was found on only 1/6 of its original acreage and this decline in acreage has continued to today.<sup>59</sup>

## **Conclusion**

Lumbering has been an important part of Alabama's history and culture since the 1700s.<sup>60</sup> Early settlers to the region relied on the vast forests to provide needed natural resources. The advent of water-powered mills improved lumber production and played a significant role in the development and growth of southern communities. After the Civil War, northern capitalists, like John Kaul came South to invest in timberland. While John and Hugh Kaul were undoubtedly some of the great timber barons of the time, they were not always viewed favorably. However, investments made by the Kaul Company went beyond the land to the development and improvement of production facilities and communities, such as the mill town of Kaulton, Alabama, which in turn, benefitted the communities they served<sup>61</sup>.

An examination of the Kaul Lumber Company offers a historical and empirical example of the impacts of changing markets, public perception and taxation on the forest industry from 1880-1935, one of the greatest periods of the forest products industry in the South. Their history represents some major themes relevant to today's concerns of the development of Real Estate Investment Trusts (REITS) and Timberland Investment Management Organizations (TIMOs): conservation and forest taxation.<sup>62</sup> Beginning in the 1990s, and escalating in the 2000s, millions of acres of forestland were sold off by timber corporations in order to enhance their profitability.<sup>63</sup> This change in ownership of forestland from industry to new ownership, predominately REITs and TIMOs, was precipitated from a combination of reasons.

While there a multitude of reasons for this modern transition three major changes are important to note as historic reflections back to the time of the Kaul Lumber Company. First, changes in generally accepted accounting principles (GAAP) established mandatory reporting methods for all publically traded companies which mandated that trees from an accounting standpoint cannot appreciate or depreciate.<sup>64</sup> Second, more efficient tax structures for owning timberland were developed such as the single taxed REITs and S-Corporations when compared to the double taxed, traditional C-corporation.<sup>65</sup> One of the benefits of REITs or TIMOs revolves around the idea of gaining tax-exemption or more tax-efficient status, which in return boosts investment value.<sup>66</sup> Acts such as the Employee Retirement Income Security Act (ERISA) of 1974 encouraged institutional investors to diversify their portfolios toward higher-risk investments while the Real Estate Investment Trust Simplification Act (REITSA) of 1997 allowed for REITs to acquire and manage timberland.<sup>67</sup> Additionally, REIT and TIMO structures allowed for exemption from the reporting requirements mandated by GAAP because they are privately owned entities<sup>68</sup>.

Lastly, as REITs and TIMOs are largely tied to providing high returns on investments, there have been concerns raised about their potential landscape impacts. For instance, TIMOs generally work on 10 to 15 year timelines and this short timeline raises the concern that more frequent ownership changes will lead to increased fragmentation and parcelization.<sup>69</sup> As forest products industry managed their land for the purpose of supplying wood to their mills, TIMOs and REITs are interested in timber production for diversification of investment through the uses of high intensity plantations and it has been suggested they may be more willing to convert forestland to other uses.<sup>70</sup>

A historical investigation of forest history and tax policy can reveal reoccurring trends and offer insight to current issues as it relates to forest land management today.<sup>71</sup> Reviewing the implications of past policies, taxes, and land management styles can improve outcomes of future endeavors and limit possible negative ecological consequences. Taxation has played a large role in land management use and forest history. Changes to the landscape in the Southeast and in Alabama due to forest industry practices of the late 1880s and early 1900s are still being felt today.<sup>72</sup> As an example, longleaf pine forest were over-harvested at the turn of the last century and now it occupies only 5% of its natural range which once covered about 59 million acres in the Southeast.<sup>73</sup> Nearly two-thirds of the threatened, endangered, or declining species in the southeastern United States are associated with the longleaf ecosystem.<sup>74</sup> With recent developments within the forest industry and the onset of REITs and TIMOs it is important to understand the ramifications both ecologically and financially.



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## **Chapter 3**

### **Ownership Changes and Harvesting Patterns Associated with the Forest Products Industry in West-Central Alabama from 1984 to 2014**

#### **Abstract**

To better gauge harvesting patterns and ownership changes associated with the divestment of forestland by forest industry and the arrival of timberland investment management organizations (TIMOs) and real estate investment trusts (REITs) on the forested landscape, eleven Landsat scenes were used to detect harvest activity within the Alabama counties of Bibb, Hale, Pickens, and Tuscaloosa from 1984 to 2014. Detected harvesting activity was paired with county parcel data and then classified based on landowner type: REITs, TIMOs, forest product industry, government, and non-industrial private forest (NIPF) landowners. Overall harvest trends showed a decrease in harvest rates from 1984 to 2005 with a slight increase in harvest rates after 2005. Per scene interval, acres harvested were highly variable for NIPF and relatively stable for forest industry during this time. Government ownership maintained relatively low and stable harvesting behavior throughout the study period. Acres harvested by REITs was relatively low. TIMOs showed an ever increasing rate of harvest within the study area until the last scene interval (2011-2014).

## **Introduction**

In the last 25 years, vertically integrated forest products companies, corporations who owned everything from the mills to the forestland, have divested of their forestland ownership. This change of forestland ownership has given rise to a diverse new group of landowners: real estate investment trusts (REITs) and timberland investment management organizations (TIMOs). This change in ownership has presented a plethora of concerns regarding land use change, fragmentation, and conservation due to the nature of these entities' objectives (Block and Sample, 2001; Turner et al., 1996; Crow et al., 1999; Clutter et al., 2005). While the long-term outcomes of these concerns are unclear, REITs and TIMOs have been associated with common land use patterns of intensive timber management and higher and better use (HBU) conversion (Bliss et al., 2010).

TIMOs generally operate on relatively short land management timelines, typically 10 to 15 years. During this time, forest stands are intensively managed in a plantation setting which include management activities such as site preparation, artificial planting, mechanical, and chemical treatments (Arano and Munn, 2006). Afterwards, the property is often sold to another investment organization or sold to be converted for HBU such as housing or commercial development (Stein, 2011). This short timeline raises the concern that more frequent ownership changes will lead to increased forest fragmentation and parcelization rates (Wear et al., 2007).

REITs, which do not operate on such short timelines, are similar to TIMOs in that both entities share the goal of maximizing financial returns for investors. As a result, it has been suggested both REITs and TIMOs may be more willing to convert forestland to other non-forest uses to help maximize returns when forest management alone will not (Hickman, 2007).

The amount of timberland owned by REITs and TIMOs has been rapidly increasing in the United States. During the early 1980s, the forest products industry owned around 69 million acres of the United States' forestlands and 39 million acres in the Southeast (Smith et al., 2004). During this time the top fifteen largest forestland owners were all vertically integrated forest product companies. By 2010, only one of those top fifteen remained with ten of the fifteen becoming TIMOs and four becoming REITs (Stein, 2011). From 2004 to 2007, industry owned timberland declined by 17.4 million acres while REITs gained 3.4 million acres and TIMOs gained 12.2 million acres in the United States (Harris, 2007). As of today, REITs and TIMOs manage more than 23 million acres of forestland in the United States (Evans and Myers, 2015).

The southeastern United States has seen the largest conversion of forest industry timberlands to REITs and TIMOs ownership. This is due, in part, to the region's large and productive forested landbase (Allen et al., 2005; Clutter et al., 2005). From 1996 to 2004, a total of 18.4 million timberland acres were sold in the Southeast (Clutter et al., 2005). Louisiana was most impacted at 3.6 million acres in timberland sales with Alabama (2.6 million acres) and Georgia (2.3 million acres) as the next highest. As of 2010, it was estimated that REITs owned 7.7 million acres and TIMOs owned estimated 8.8 million acres in the Southeast (Zhang et al., 2012).

This shift in ownership has the potential to impact many southern states economically as well as ecologically, due to the fact that many have relied on forests and forestland for livelihood for over a century. For example, 70 percent of the state of Alabama is in forestland. It ranks 5th in species diversity in the United States and is the most ecologically diverse state east of the Mississippi River (Stein, 2002). Sales of forest products and related sectors in Alabama total \$11.2 billion as of 2010 (Fields et al., 2013). Yet, it ranked second in the amount of timberland

sold between 1996 to 2004 (2.6 million acres). During this same time, Clutter et al. (2005) noted large changes in landownership in west-central Alabama from 1996 to 2004. Additionally, companies such as International Paper (IP), a formerly vertically-integrated forest products company which was a major landowner in Tuscaloosa County and surrounding areas, sold all of their land around 2006.

One of the ways to investigate these forested landscape changes is through satellite imagery. Landsat satellite imagery has long been used for monitoring the forested landscape and is an accurate and effective way to document landscape changes for the use of ecological applications (Cohen and Goward, 2004). Likewise, vegetation indexes, such as the Normalized Difference Vegetation Index (NVDI), have been successfully applied to research regarding temporal and spatial trends and variation in vegetation distribution, productivity and dynamics, monitoring of habitat degradation and fragmentation, and the ecological effects of climatic disasters such as drought or fire (Pettoirelli et al., 2005). Additionally, the use of parcel and property tax assessor's data can allow for harvest activity to be identified by landowner type (Randle et al., 2015; Jin and Sader, 2006).

More studies are needed to address the effects that the rise of REITs and TIMOs and decline of forest industry forestland ownership have had on the forested landscape (Noone et al., 2012; Hickman, 2007; Clutter et al., 2005). Therefore, linking landscape disturbance with forestland ownership could provide insight to changes not only with regard to forestland ownership but also harvesting activity associated with these ownership changes (Jin and Sader, 2006). The objectives of this research were to: (i) identify the extent of forest industry's divestment of forestland in west-central Alabama during the period from 1984 to 2014 and (ii) assess harvest activity by landowner type during that time.

## **Study Area**

For this current study we chose to examine landownership change in the west-central Alabama counties of Bibb, Hale, Pickens, and Tuscaloosa. These counties represent diverse landownership, population demographics, and encompass multiple geographic regions and forest types. Also this area has a rich forest history as it was the historical home to the Kaul Lumber Company, a large vertically intergrated lumber of the early 1900s. This area is now home to the Westervelt Company, a large locally-owned vertically integrated company, in addition to other forest products companies. Additionally, this area is home to the city of Tuscaloosa which is the fifth largest city in the State. In addition, programs such as the Forest Legacy Program have placed high conservation priorities on Bibb (Priority 1), Hale (Priority 2), and Tuscaloosa County (Priority 2) (Boyce et al. 2002). These priorities, which rank areas within the State for conservation need, were set to help protect ecosystems such as dolomite glades, Fall Line Hills longleaf pine forests, and riparian corridors and associated forested wetlands along rivers such as the Sipsey and Cahaba Rivers to the growing human pressure on these biodiversity “hotspots”. Pickens County is also of interest as it is one of the highest timber producing counties in Alabama and is 83% forested (Alabama Forestry Commission, 2011).

## **Methods**

Landsat 5 (launched in 1984 and decommissioned in 2013) and Landsat 8 (launched in 2013 and still active) are low Earth orbit satellites that collect imagery at a 15-30 meter resolution. Leaf-on Landsat 5 and 8 imagery taken between the months of March and October with 0 to 20 percent cloud cover was downloaded from Glovis (<http://glovis.usgs.gov/>) for the following years: 1984, 1987, 1990, 1993, 1996, 1999, 2002, 2005, 2008, 2011, and 2014 for



Path/Row 21/37 and 20/37. As designated by the Worldwide Reference System (WRS) global notation system for Landsat data, Path/Row 21/37 and 20/37 encompasses the entirety of the study area. Harvest change detection accuracy increases as imagery dates are closer together, therefore 2 to 3 years between images can allow for suitable detection accuracy for clearcuts as well as forest harvest activity that does not completely remove the overstory canopy (Wilson and Sader, 2002).

Satellite images for each year were converted to Top of Atmosphere (TOA) reflectance for the purposes of improving the use of vegetation indexes (Chander and Markham, 2003; USGS, 2015). For the purpose of vegetation detection, a NDVI, transformed NDVI, Soil-adjusted Vegetation Index (SAVI), and a transformed SAVI were tested with the transformed NDVI giving the best results (Rouse et al., 1973; Huete, 1988). To avoid agriculture change detection, a forest/non-forest mask was created from the 1996, 2001, 2006, and 2011 National Landcover Dataset and was used to mask non-forested areas by selecting and merging pixels identified as “Deciduous”, “Evergreen”, “Mixed”, or “Woody Wetlands” (Vogelmann et al., 2001; Homer et al., 2007; Fry et al., 2011; Homer et al., 2015). If needed, a cloud mask was also applied to each scene to avoid false positives as a result of clouds or cloud shadow.

Changes in forest cover were calculated by subtracting the transformed NDVI values of a Landsat image from that of the preceding image with an imagery differencing technique

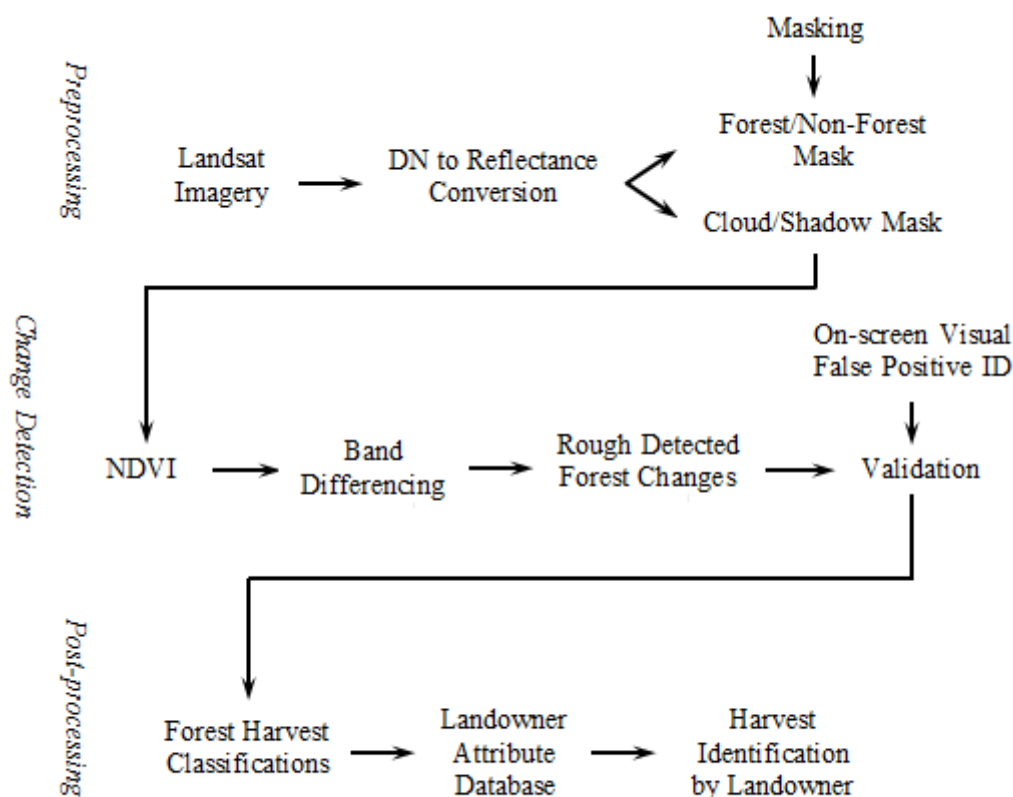
$$Dx \frac{k}{ij} = x \frac{k}{ij}(t_2) - x \frac{k}{ij}(t_1) + C$$

where  $x \frac{k}{ij}$  = pixel value for band  $k$  and  $i$  and  $j$  are line and pixel numbers in the image,  $t_1$  = first date,  $t_2$  = second date, and  $C$  = a constant to produce positive digital numbers (Singh 1989).

Harvest activity was then statistically derived from the average NDVI value by adjusting the threshold by one standard deviation for each scene and then empirically adjusting the thresholds

to best fit the scene. Each scene was then subsequently reclassified into change and non-change thematic maps. The thematic layer was then converted to polygons and all areas greater than 10 acres were extracted and the resulting image was clipped to the study area. On-screen visual interpretation was employed to correct errant omissions, remove false positives, and to improve overall accuracy with the aid of Landsat imagery, Google Earth, NDVI change detection rasters, and NAPP Imagery (Borrelli et al., 2014).

For the purpose of detecting harvesting behavior by landowner type, harvest polygons were identified with landowner attribute data as developed for each county. Based on the methods of Randle et al. (2015), a landowner database was created from property books for each county from the late 1980s and the early 1990s and compared to county tax assessors GIS databases from 2014. Harvest polygons were then categorized into the following landowner types: REITs, TIMOs, forest product industry, government, and non-industrial private forest (NIPF) landowners. Figure 3.1 provides the methodology for the entire process.



**Figure 3. 1. Methodology for the detection of forest cover change and landowner identification for properties in Bibb, Hale, Pickens, and Tuscaloosa Counties (adapted from Borrelli et al., 2014).**

For the purpose of understanding TIMO harvest behavior after a parcel was purchased, TIMO parcels that had harvest activity on them were classified by scene intervals (3 years) from the last purchase of the deed. For example, both a parcel that was purchased in 2006 and cut in 2007 and a parcel purchased in 2012 and harvested in 2013 would both be classified as 0, indicating that the parcel was harvested in the same harvest detection interval as it was purchased (Table 3.1). A parcel that was harvested 1 scene before the deed was purchased would be classified as a -1; A parcel that was harvested 1 scene after the deed was purchased would be classified as a 1.

**Table 3.1. TIMO deed purchase and harvest detection interval classifications.**

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-4+	Parcel was harvested 4 or more harvest detection intervals before the deed was purchased
-3	Parcel was harvested 3 harvest detection intervals before the deed was purchased
-2	Parcel was harvested 2 harvest detection intervals before the deed was purchased
-1	Parcel was harvested 1 harvest detection interval before the deed was purchased
0	Parcel was harvested in the same harvest detection interval as it was purchased
1	Parcel was harvested 1 harvest detection interval after the deed was purchased
2	Parcel was harvested 2 harvest detection intervals after the deed was purchased
3	Parcel was harvested 3 harvest detection intervals after the deed was purchased
4+	Parcel was harvested 4 or more harvest detection intervals after the deed was purchased

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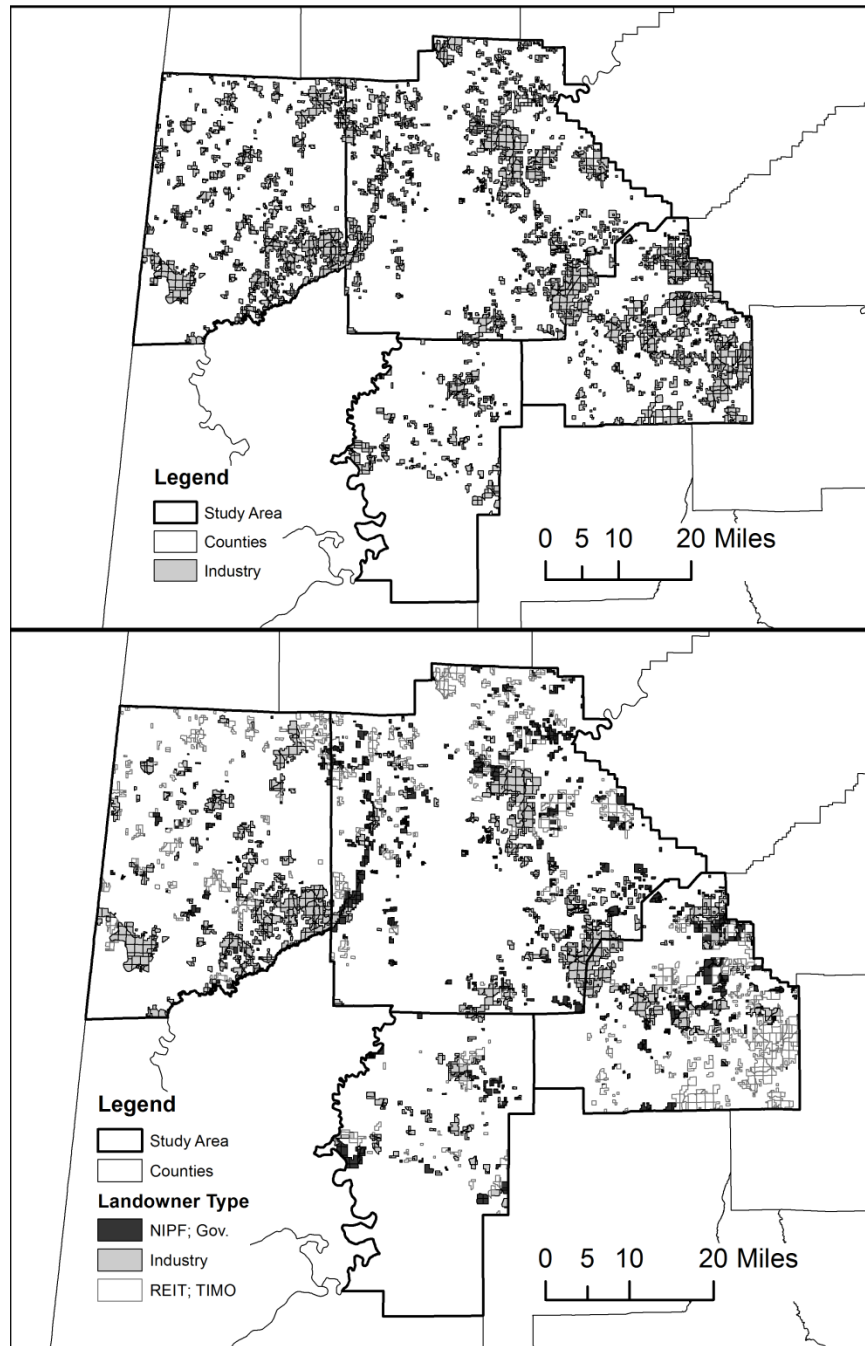
## Results

### *Landownership Changes*

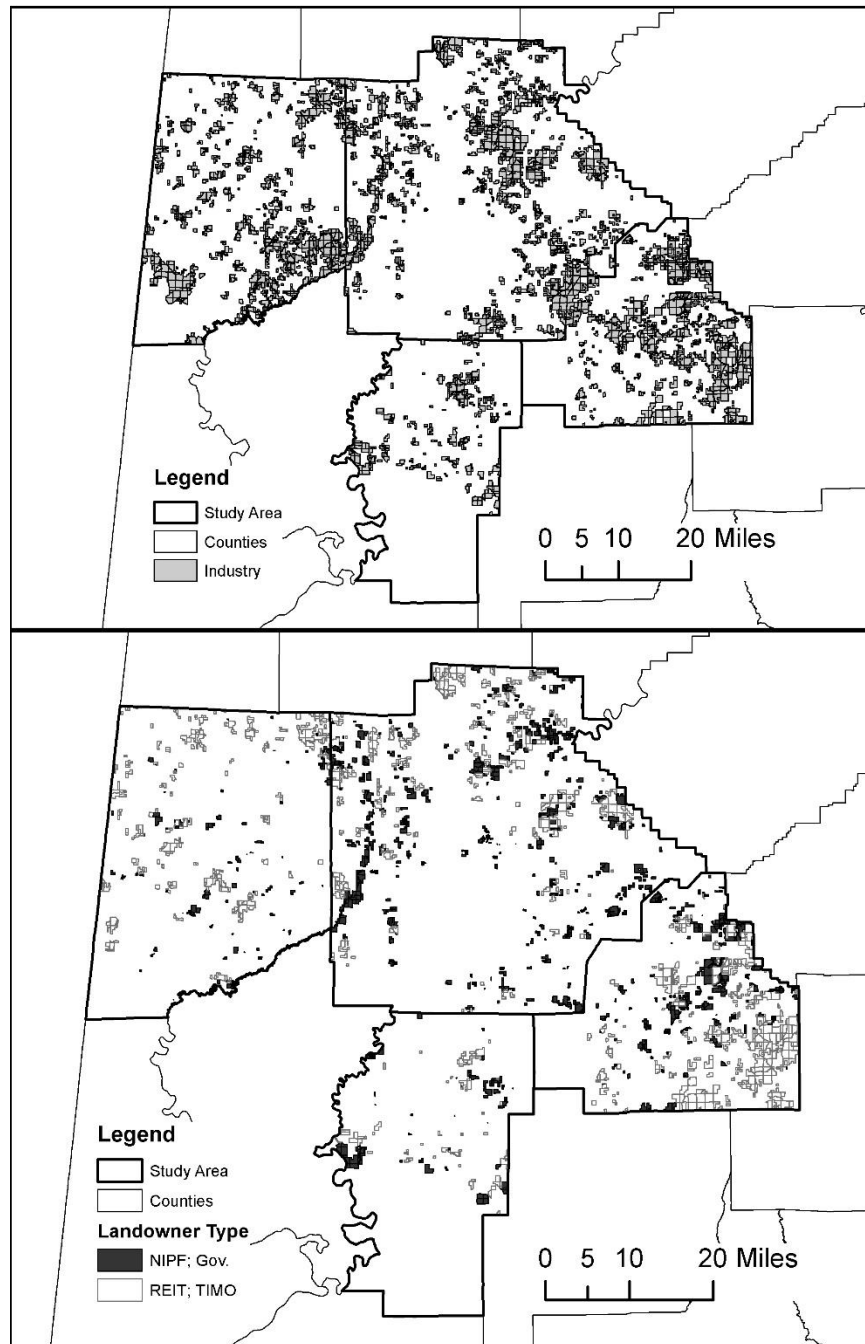
A total of 405,048 acres were identified as being owned by the forest products industry from the late 1980s and early 1990s which comprised 22 percent of the 1,841,000 acres of forestland in the four counties in this current study (Table 3.2, Figure 3.2, and Figure 3.3). Thirty-one different forest product companies ranging from large corporations to local family mills were found in the study area during this time. As of 2014, the forest products industry retained a little less than half of their former ownership in the area. REITs and TIMOs, as of 2014, owned 140,775 acres or 34.8 percent of the previous forest products industry forestland representing over half of the acres in new ownership. NIPF landowners acquired 79,338 acres or 19.6 percent of former forest industry forestland while varying government entities acquired around 4,603 acres or 1.1 percent. In terms of total ownership, former forest industry timberland only represented 61 percent of the total TIMO ownership within the four counties. For REITs and forest products industry, former forestry products industry land represented 75 percent and 89 percent, respectively, of their entire landbase. Despite the forest products industry, as a whole, selling large amounts of their land from the 1990s to 2014, a few forest product companies acquired roughly 23,000 acres that were not former forest industry land.

**Table 3.2. Current ownership by acres from forestry industry forestland and percent total ownership by acres for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

	2014 Ownership of Land Acquired from Forest Industry (Acres)	2014 Percent Ownership of Land Acquired by Forest Industry	2014 Total Ownership by Landowner (Acres)	2014 Percent of Former Forest Industry Land Acquired to Total Ownership
NIPF	79337	19.6%	N/A	N/A
GOV	4603	1.1%	N/A	N/A
INDUSTRY	180333	44.5%	203260	88.7%
REIT	27100	6.7%	35969	75.3%
TIMO	113675	28.1%	185852	61.2%
Total	405,048	100%	425081	



**Figure 3.2. (Top) Forest product industry forestland ownership from the late 1980s and early 1990s for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama. (Bottom) Forestland ownership by landowner type as of 2014 acquired from forest products industry for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**



**Figure 3.3. (Top) Forest product industry forestland ownership from the late 1980s and early 1990s for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama. (Bottom) Change in landowner type as of 2014 from forest products industry for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

### *Parcelization*

From the late 1980s and early 1990s to 2014, the number parcels owned by forest industry increased at various rates (Table 3.3). Tuscaloosa and Bibb Counties showed high rates of parcelization as the result of land sales while Pickens and Hale showed a much lower rate. Increases in parcels were positively correlated to increases of county population but were not statistically significant (Pearson's  $R = .927$ ,  $P > .05$ ). Total change in parcels were positively correlated with total changes in population within an individual county (Pearson's  $R = .959$ ,  $P = .04$ ).

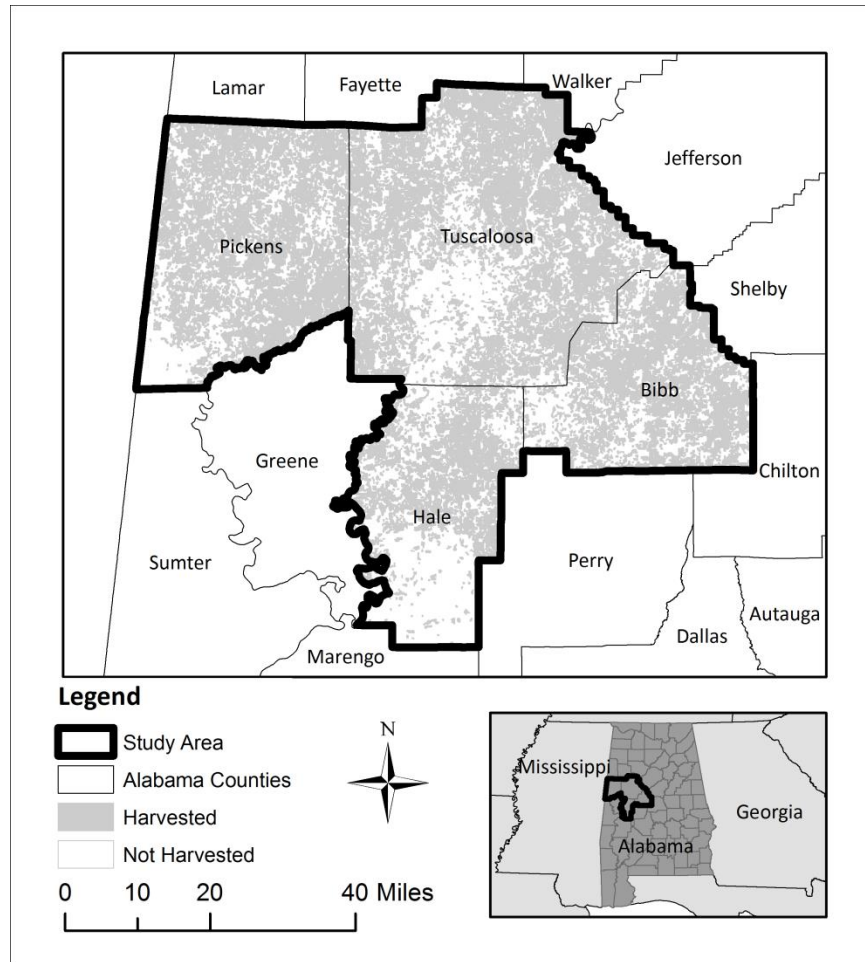
**Table 3.3. Number of parcels and parcel change for forest products industry owned land from the late 1980s and early 1990s for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

	Number of Parcels in the Late 1980s and Early 1990s	Number of Parcels in 2014	Percent Increase	Total Change in Parcels by County	Total Change in Population by County
Bibb	514	857	66.7%	343	6021
Hale	227	253	11.5%	26	262
Pickens	695	762	9.6%	67	-953
Tuscaloosa	925	1699	83.7%	774	44134

### *Harvesting*

From 1984 to 2014, a total of 1,159,970 acres or 63 percent of all forestland between the four counties as of 2014 were detected as harvested within the study area (Figure 3.4). Large areas of no harvest activity in Tuscaloosa are due, in part, to the land area taken up by the City of Tuscaloosa, the fifth highest populated city in Alabama which covers a total of 44,998 acres. Lack of harvesting in the southwest portion of Pickens and the southern portion of Hale County correspond with the Black Belt region, a region traditionally associated with agriculture.

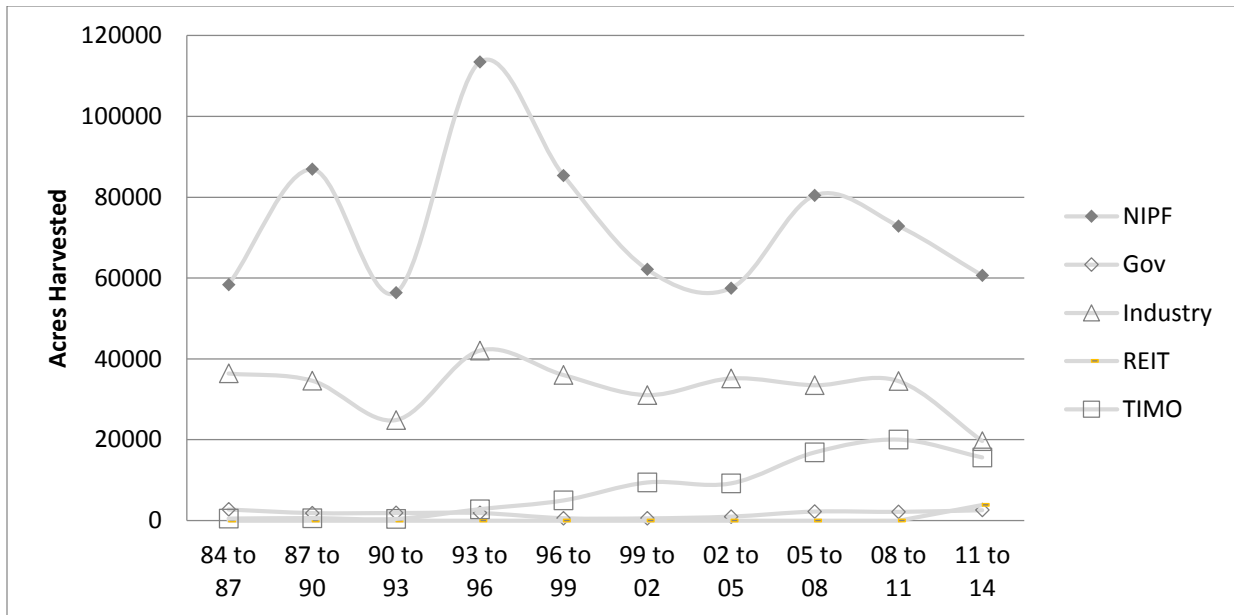




**Figure 3.4. Location of acres harvested between 1984 through 2014 for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

Harvest acreage by landowner type showed slightly different trends through time (Table 3.4 and Figure 3.5). NIPF landowner's harvesting behavior was cyclic, however, they maintained the highest amount of harvested acres through in all detection intervals from 1984 to 2014 and would consistently account for half or more of the harvested acres per harvest detection interval. For NIPF landowners, harvested acreage rose sharply during 1993 and then declined until 2002. Harvested acreage for NIPF landowners increased from 2002 until 2008 when acres harvested again declined until 2011.

Forest products industry shows relatively stable harvesting behavior throughout the time period with the exception of 2011 to 2014, which showed a decline. Forest products industry consistently accounted for 25 percent to 35 percent of total harvested acres per harvest detection interval. TIMO harvested acres increased from 1996 to 2011 and then declined after 2011. Harvested acres by TIMOs would not exceed forest industry harvest acres at any given harvest detection interval. REIT harvested acreage was absent until the 2011 to 2014 harvest detection interval. Government agencies such as the US Forest Service and US Fish and Wildlife Service maintained a low and relatively stable rate of harvesting throughout the study period and accounted for little of acres harvested.



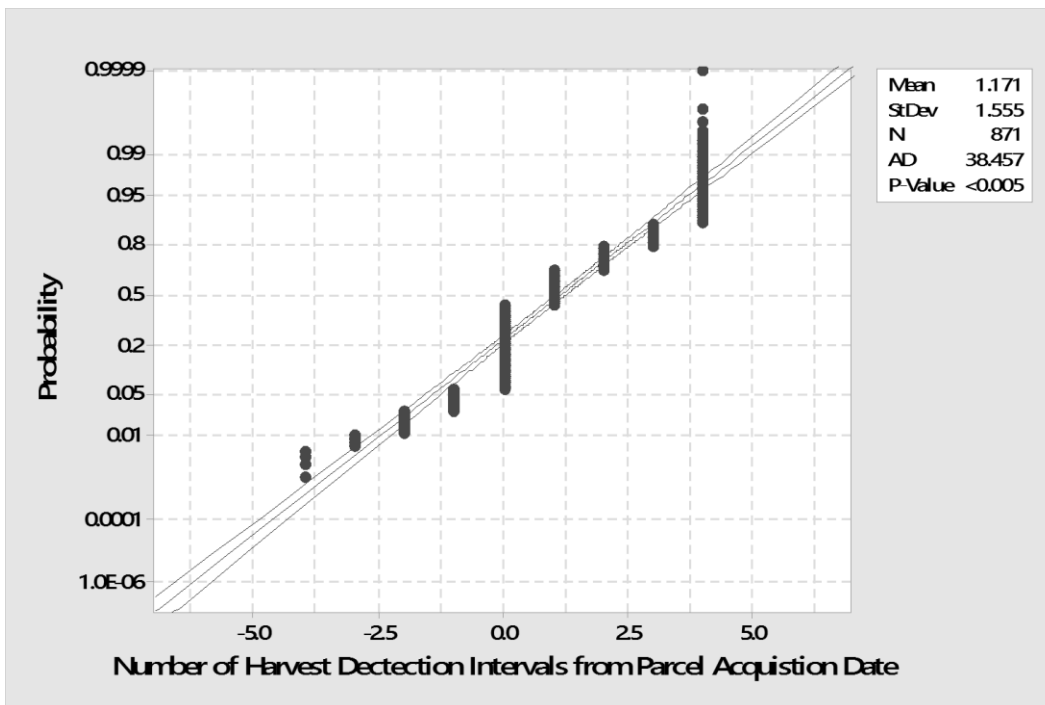
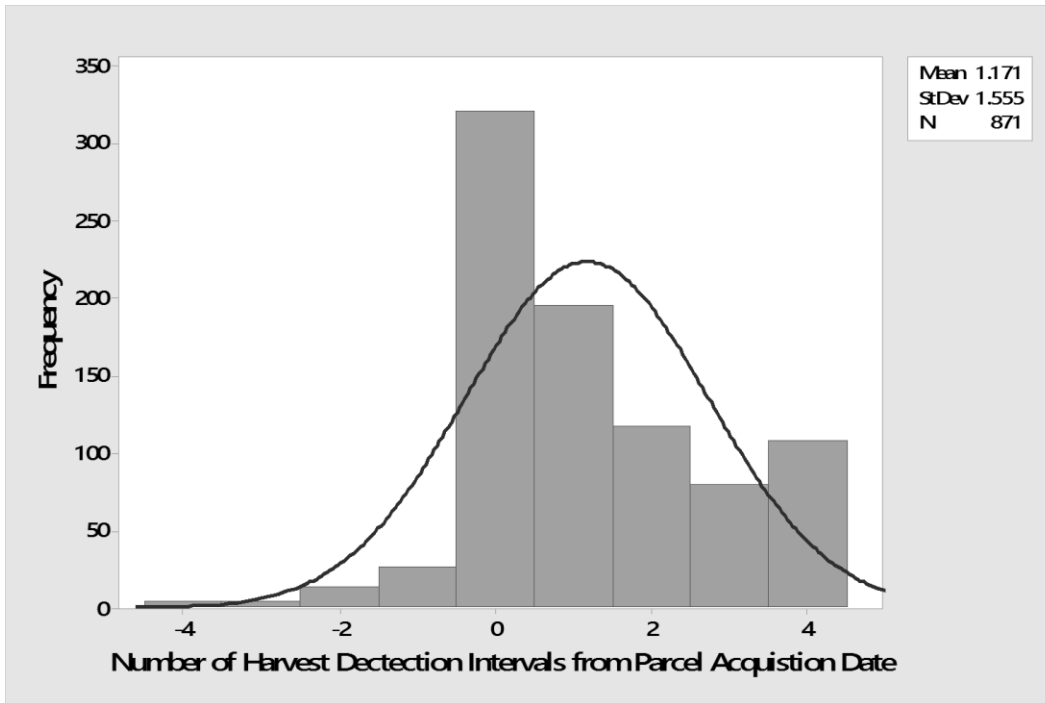
**Figure 3.5. Acres harvested between 1984 to 2014 by landowner type in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

**Table 3.4. (Top) Acres harvested between 1984 to 2014 by landowner type in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama. (Bottom) Percentages of acres harvested between 1984 to 2014 by landowner type in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

Type	84-87	87-90	90-93	93-96	96-99	99-02	02-05	05-08	08-11	11-14
NIPF	58377	86895	56409	113430	85350	62148	57518	80454	72874	60644
Gov.	2764	1866	1880	1884	582	549	982	2251	2174	2587
Industry	36400	34606	24870	42075	36019	31047	35181	33496	34518	19672
REIT	0	0	0	0	0	0	0	0	0	3860
TIMO	481	600	402	2816	4977	9418	9197	16872	20028	15627
SUM	98022	123967	83561	160205	126928	103162	102878	133073	129594	102390
NIPF	59.6%	70.1%	67.5%	70.8%	67.2%	60.2%	55.9%	60.5%	56.2%	59.2%
Gov.	2.8%	1.5%	2.2%	1.2%	0.5%	0.5%	1.0%	1.7%	1.7%	2.5%
Industry	37.1%	27.9%	29.8%	26.3%	28.4%	30.1%	34.2%	25.2%	26.6%	19.2%
REIT	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%
TIMO	0.5%	0.5%	0.5%	1.8%	3.9%	9.1%	8.9%	12.7%	15.5%	15.3%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

*TIMO Harvest Behavior*

From parcels purchased by TIMOs, classification 0 (parcel was harvested in the same harvest detection interval as it was purchased) had the highest frequency with 1 and 2 classifications having the next highest frequencies respectively (Figure 3.6). On average, a parcel was harvested 1.17 (+/- 1.55) scenes intervals from when its deed was acquired ( $P < .005$ ). Based on our findings, a parcel has a 50% chance that in 1.17 (+/- .11) scene intervals (1 to 5 years) that will be harvested from the deed is purchased and a 90% percent chance that it will be harvested within 3.16 (+/- .24) scene intervals (1 to 10 years).



**Figure 3.6. (Top) Distribution of scenes that occurred within a given scene interval based on the deed purchase date. (Bottom) Probability of harvest activity occurring at each scene from the deed purchase date from 1984 to 2014 for TIMOs in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

## **Discussion**

### *Landownership Changes*

Despite the forest products industry losing roughly half of their former acreage in the study area, corporations showed variable behaviors. Westervelt, a company founded in 1884 and headquartered in Tuscaloosa, Alabama, took advantage of various entities selling their forestland and bought more land than it sold. Other corporations with local roots such as McShan Lumber Company and Melrose Timber Company, also held on the majority of their land. Both of the companies also started during the 1800s and their landbases were comprised of local area landholdings.

Other companies such as IP and Weyerhaeuser showed much different behavior largely due to financialization and pressure for increased shareholder returns (Gunnoe, 2016). For IP, the company made acquisitions during the 1980s through the 2000s such as the Hammermill Paper Company in 1986, Federal Paper Board in 1996, Union Camp Corporation in 1999, and Champion International Paper in 2000. In 2005-2006, IP restructured by selling over six million acres and several mills to various companies. Within the study area, IP would sell roughly 40,700 acres.

IP restructuring was a due to culmination of several reasons. During the 1990s, the forest product industry was financially performing weakly which included poor shareholder returns (Gunnoe, 2016). Additionally, some forest products companies had accrued large amounts of debt to enhance their international competitiveness by way of consolidations (Block and Sample, 2001). Rising land cost coupled with changing mentality that forestland ownership was no longer necessary to ensure the future availability of raw materials at a reasonable cost led to the forest industry selling their landbase (Hickman, 2007). The selling of forestlands this way, in part,

helped to reduce debt, to help break the trends of weak financial performance, and help to improve returns (Clutter et al., 2005). Similar to IP, Weyerhaeuser had acquired other timber companies such as MacMillan Bloedel in 1999. Pressured by similar reasons as IP, Weyerhaeuser took a different path by transitioning from a C-corporation to a REIT status in 2010.

The onset of TIMOs was due to several variations in landowner behavior. The most prevalent trend was as timber companies divested parts or the entirety of their landbase, TIMOs took advantage of mass land holdings being sold. Forest product companies such as the Olon Belcher Lumber Company, Kimberly Clark, and Albert Holman Lumber Company sold parts or all of their landbase in the late 1990s and early 2000s allowing various TIMOs to establish themselves. This trend would continue with IP who sold off its entire landbase to TIMOs such as the Red Mountain Timber Company in 2006 through 2008. Other forest industry companies such as Westervelt, Weyerhaeuser, and Melrose Timber Company have continued to sell off parts taking advantage of HBU. Other small mill owners sold their forestland during this time taking advantage of high land prices during the early 2000s. Others suffered as forest product demand greatly plummeted after the house market crash in 2008. Another trend was that some large local family landowners took advantage of HBU and sold some of their land holdings to TIMOs. Lastly, some investment companies would acquire already established forested landbases owned by other investment companies. One example is the acquisition of the Canterbury Trust, an investment and consulting services company, by Synovus Financial Corp, a multi-financial services company, in 1999.

### *Parcelization*

Number of parcels increased within the counties for various reasons. For Pickens and Hale County where companies, such as Westervelt resided, sold little land resulting in little parcel change. IP had large landholdings located in Bibb which were sold off and resulted in splitting parcels for HBU. For Tuscaloosa, large changes were the result of HBU conversion due to companies like Weyerhaeuser and Westervelt developing and/or selling forestland for residential parcels along the Black Warrior River, Sipsey River, and around the city of Tuscaloosa. This is supported by Hartsell and Vissage (2001) who reported for west-central region Alabama that roughly 80 percent of land diverted from timberland has been cleared for urban and related land use, particularly around the Tuscaloosa area.

### *Harvesting*

The relatively stable harvesting rates of forest industry until 2008 might be explained for several reasons (Figure 3.4). Westervelt, one of the largest landowners in the study area, would maintain the majority of its landbase. The dip in 2008-2011 also corresponds with the transition of Weyerhaeuser to a REIT in 2010 and closure of several smaller mills after the financial crisis of 2008. To date, Weyerhaeuser's conversion to a REIT has not shown any difference in harvested acres between pre-REIT and post-REIT status.

Harvesting patterns associated with NIPF landowners and to a lesser degree forest products industry follow the cyclical nature of the general economy (Figure 3.4) (Newman and Wear, 1993). In 1993, stumpage prices for northern Alabama doubled compared to the 1992 prices as seen in the large spike of harvest acres in Figure 3.4. Similarly, increases in 2002 to 2008 mirrors the economy growth of the early 2000s and after the housing crisis in 2008 shows a

decline. In general, NIPF landowners are more sensitive to price change than their industrial counterpart and are more willing to delay a harvest until stumpage prices are more favorable to the landowner (Newman and Wear, 1993). However, NIPF landowner harvesting behavior, which has become increasingly important due to forest industry's divestment of land, is still not well understood (Silver et al., 2015).

### *TIMO Harvest Behavior*

The increasing harvest behavior with TIMOs mirrors the increase in acres owned by TIMOs in the study area (Figure 3.4). Our study found that a forestland tract has a very good chance (50%) of being harvested in the first 5 years after the tract is acquired. This has potential to impact forest diversity in the state. Zhang et al. (2012) showed that TIMOs and REITs in the Southeast are removing twice the amount of hardwood than is annually grown on their lands. Their data suggests that a conversion of hardwood forests to softwood forests is occurring in timberlands owned by TIMOs and REITs (Zhang et al., 2012).

Secondly, as TIMOs operate on short timeframes, typically 10 to 15 years, this behavior could have serious ecological implications in the future due to increased fragmentation and parcelization rates (Bliss et al. 2010, Wear et al., 2007). As land holdings are continuously traded, land holdings might be broken in smaller and smaller holdings of land even if the landowner type changes. While parcelization could occur between transfer of land from TIMO to TIMO, this trend of parcelization could have effects on subsequent, non-TIMO landowners as well. The amount of acres owned, how the land was acquired, and length of ownership have been shown to be important indicators for management activity levels (Birch et al., 1982).



## **Conclusion**

The divestment of land by the forest products industry and the arrival of REITs and TIMOs have very different stories on multiple scales (Randle et al., 2015; Gunnoe, 2016; Ameyaw, 2013). These differences are a product of scale due to factors such as physiographical regions and differences between local and regional economies (Holling, 2001). These results begin to illuminate the effects of the decline of forest industry's landbase and an ever increasing TIMO landbase on harvesting rates and management behavior. Also, these results presented in this paper help continue to emphasize the current and potential impacts of local economies and societies (Randle et al., 2015; Ameyaw, 2013). Secondly, the methods outlined in this paper offer an effective way to monitor harvest behavior in other regions of the state or other states where it might be of interest. Further monitoring would be beneficial in discovering trends throughout the United States concerning REITs and TIMOs. Additionally, monitoring would help elucidate if there is any divergence from current trends of landownership patterns associated with REIT and TIMO ownership.

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## **Chapter 4**

### **Timber Leasing and Management Factors for NIPF Landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama**

#### **Abstract**

Forest ownership changes in the southern United States have prompted many to question future wood supply trends and the historic relationship between industry and non-industrial private forest (NIPF) landowners. Due to this, there is interest in gauging the current involvement and interest of NIPF landowners with regard to longterm timber leases with forest products companies. In August of 2015, a survey was conducted to assess how NIPF landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties in Alabama manage their forests and interact with forest product companies. This is an area of interest because large changes in landownership have been observed in the last decade. Only 2% of respondents said that they were actively engaged in a timber lease. With the lack of timber leases, and loss of industrial forest lands, industry may be more dependent of the activeness of NIPF management and harvesting in the future.

## **Introduction**

Changes in forest ownership in the Southeastern US have prompted the question of potential impacts of the inflow of wood supply for the mills and the relationship between forest industry and non-industrial private forest (NIPF) landowners. Beginning in the 1990s, much of the forest products industry began to divest its forested landbase, relying on the inputs of other sources for its timber supply. Many of the new landowners were timberland investment management organizations (TIMOs) and real estate investment trust (REITs) with other entities such as non-industrial private forest (NIPF) landowners comprising a smaller portion (Zhang, 2008). This change is markedly different from the mindset of the early 1900s and, in part, an abandonment of the idea of vertical integration where companies owned everything from the land to the mills (Ohanian, 1994). This change came about in reaction to evidence that fully integrated firms have higher systematic and bankruptcy risk in turbulent product-market environments (D'Aveni and Ilinitich, 1992).

In some cases, mills entered into supply agreements with the new owners, such as TIMOs, to help maintain a supply of timber inputs (Yin and Izlar, 2001). Nevertheless, with “guaranteed” timber supplies no longer available, forestland divestment has created a larger dependence on NIPF landowners for timber inputs. Therefore, there is a renewed interest in gauging the current involvement and interest of NIPF landowners in entering into long term timber leases with forest products companies (McGill et al., 2008).

The use of longterm timber leases was a method employed from the 1940s through the 1970s where the lease agreement would typically last 30, 60, or sometimes 90 years (Greene, 1979). Greene (1979) expounds on the benefits and drawbacks of timber leases for both forest industry and forestland owners. For landowners engaging in a lease, they receive regular

payments for the use of their property to grow timber. This can improve cash flow to timberland when compared to potentially long intervals between timber harvests of 10 to 15 years. While forest industry manages the land under lease for timber production, landowners are still allowed to use their land for hunting, fishing, or personal recreation. The largest drawback for landowners is the loss of absolute control over a leased property. For industry, it allows them to maintain a future supply of inputs at low cost. The drawback for industry is that they do not realize the full value of timberland as if it was in fee simple ownership meaning they cannot benefit from higher and better use or an increase in land value.

In the 1970s, a survey by Siegel (1973) showed that 54 timber products companies held roughly 6.7 million acres in long term timber leases with NIPF landowners in the South. However, the practice of long timber leases started to decline during the 1980s as timber companies began purchasing timberland in lieu of timber leasing (Zinn and Miller, 1984). By the 1990s, there was another change of philosophy where ownership of timberland was deemed unnecessary to ensure the future availability of raw materials at a reasonable cost resulting in an increased reliance on NIPF landowners for their timber supply (Stein, 2011).

However, NIPF landowners often do not manage as intensively, own much smaller acreages, and can have highly varying attitudes towards management compared to their forest industry counterparts (Arano and Munn, 2006). NIPF landowners do not always have timber production as their primary objective as they can have a wide array of objectives such as personal recreation, family legacy, and hunting (Butler and Leatherberry, 2004). Additionally, landowners who value non-marketable outputs such as outdoor recreation are less likely to manage intensively (Siry, 2002).



Within Alabama, the National Woodland Owner Survey (2016) indicates roughly 1500 NIPF respondents in timber leases that accounted for roughly 666,000 acres (National Woodland Owner Survey, 2016). As industry has divested its land, how many leases remain and how they might have influenced the decisions to sell is unclear. It is also uncertain, how do NIPF landowner objectives align with the objectives of mills? In an effort to better understand this dynamic, the objectives of this paper are to: a) examine how many residual timber leases are in affect and, b) gauge the overall objectives of NIPF landowners in Bibb, Hale, Tuscaloosa and Pickens counties in Alabama.

## Study Area

Clutter et al. (2005) observed large changes in landownership in Alabama, particularly in west-central Alabama. Additionally, companies such as International Paper, a formerly vertically-integrated forest products company which was a major landowner in Tuscaloosa County and surrounding areas, sold all of their land from 2006 to 2008. The counties of Bibb, Hale, Pickens, and Tuscaloosa offer a diverse landownership, population demographics, and encompass multiple geographic regions and forest types (Table 4.1, Table 4.2, and Figure 4.1).

**Table 4.1. 2010 Population, forestland acres, and timber removals for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama (US Census Data, 2014; Alabama Forestry Commission, 2014).**

County	2010 Census Population and Rank in Alabama	2013 Forestland Acres and Rank in Alabama	2013 Timber Removals (Million Cubic Feet) and Rank in Alabama
Bibb	22,915 (45th)	323,503 (30th)	17.3 (26th)
Hale	10,591 (66th)	354,481 (24th)	18.6 (24th)
Pickens	19,746 (50th)	466,800 (11th)	33.3 (9th)
Tuscaloosa	194,656 (6th)	681,585 (3rd)	24.0 (17th)

**Table 4.2. 2014 Census data of average poverty levels, median income, and education for Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama (US Census Data, 2016).**

County	Percent of Population Below Poverty	State Average	Average Median Income	State Average	Percent of Population with Bachelor's Degrees	State Average	Percent of Population with High School Degrees	State Average
Bibb	18.1%	-1.2%	\$37,984	-\$5,527	10.2%	-12.9%	77.9%	-5.8%
Hale	28.1%	+8.8%	\$30,839	-\$12,672	14.0%	-9.1%	79.0%	-4.7%
Pickens	25.0%	+5.7%	\$29,839	-\$13,672	9.6%	-13.5%	78.6%	-5.1%
Tuscaloosa	18.0%	-1.3%	\$46,448	+\$2,937	27.7%	+4.6%	87.0%	+3.3%
Alabama	19.3%		\$43,511		23.1%		83.7%	



**Figure 4.1. Survey study area of Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

## **Methods**

In an effort to better understand Alabama's NIPF landowners with regard to long term timber leases, involvement in management decisions, importance of management objectives, and associated forest type ownership, a survey was developed under Auburn University Institutional Review Boards (IRB) protocols. The questionnaire consisted of ten, multiple choice or fill in the blank questions. At the end of the survey, a comment page was included to provide opportunity for additional comments. The sample consisted of 1000 randomly selected taxpayers who owned 100 acres or more in Bibb, Hale, Pickens, or Tuscaloosa Counties in Alabama. For landowners associated with timber leases in Alabama, the National Woodland Owner Survey indicates that 100 acres or more are the most common amount of acres owned (National Woodland Owner Survey, 2016). The sample was selected from publicly available tax payer records from the 2014 tax assessor's office for each county listed above.

On August 10, 2015, a pre-notice letter was sent to notify the recipient of the research project and to inform them of the up-coming survey (Appendix A). On August 14, 2015, the survey was mailed which included a cover letter with more specific instructions and questionnaire to complete (Appendix B and Appendix C). Recipients were asked to return blank surveys if not interested or unable to complete the questionnaire. A post-notice letter was mailed out a week later to remind landowners to complete and return the survey and thanking those that did (Appendix D). A week after the post-notice letter, a second survey letter was sent out with another information letter and survey (Appendix E). A total of 54 surveys were returned due to bad addresses and 17 people indicated that did not wish to participate the survey leaving 929 valid recipients. With the adjusted sample size of 929, we had a response rate of 26% or 243 completed surveys.

## Results

Table 4.3 displays the location of forestland ownership and residence for those who responded to the mail survey. In total, respondents owned a total of 190,436 acres or 8.6% of all acres in the four counties. Of those who responded to the survey, forestland ownership was highest in Tuscaloosa while Bibb had the lowest amount of forestland owned. Sixty percent of all respondents reported living in the county in which the majority of their forestland was located. Ninety-one percent of all landowners only own forestland in one county. With total acres owned in the study area, 33.4 percent of all respondents reported owning 100 to 250 forested acres while landowners owning 250 to 500 forested acres represented the next highest category at 27.3%. Those owning less than forested 100 acres were the least represented group of landowners at 6.9%.

Eighty-three percent of the respondents said that they actively managed their forestland (Table 4.4). When asked what entities were involved in management decisions associated with their forestland, 38.1% used a private consulting forester with the next highest group stating they worked with the Alabama Forestry Commission (14.8%). Forty-five percent of the respondents stated that they managed their forestland themselves but some selected this option in conjunction with another option. Respondents reported getting assistance from consulting firms or companies or timber companies were both fairly low at 6.9% and 5.8% respectively. Respondents that choose the category “other” indicated that either a family member or a friend that had forestry experience aided with forest management. Most respondents (82.5%) stated that they had only one entity assisting with the management of their lands.

Roughly 2% of respondents claimed to have a timber lease. One respondent indicated that a lease had been initiated within the last ten years while another landowner stated that their lease

dated back to the 1960s. Two responses acknowledged that they had a timber lease with no additional information. Two additional respondents indicated that their land had previously been in a lease but was no longer due to the contract expiring and not being renewed.

**Table 4.3. Descriptives of forestland and residence of respondents to 2015 survey of forest landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

Response	Percent of N
Own Forestland (N = 243)	
Yes	90.9%
No	9.1%
County of Forest Ownership (N = 221)	
Bibb	13.9%
Hale	22.5%
Pickens	27.9%
Tuscaloosa	35.7%
Acres owned (N = 216)	
Less than 100 acres	6.9%
100 to 250 acres	34.3%
250 to 500 acres	27.3%
500 to 1000 acres	16.7%
1000 or more acres	14.8%
Forest Ownership in Number of Counties (N = 221)	
1 County	91.0%
2 Counties	8.1%
3 Counties	0.5%
4 Counties	0.5%
County of Resident (N = 216)	
Bibb	6.5%
Hale	7.9%
Pickens	12.0%
Tuscaloosa	32.9%
I do not reside in any of these counties	40.7%

**Table 4.4. Management characteristics of respondents to 2015 survey of forest landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

Response	Percent of N
Actively Manages Forestland (N = 216)	
Yes	83.8%
No	16.2%
Entities Involved in Management (N = 189)*	
Alabama Forestry Commission (AFC)	14.8%
Natural Resources Conservation Service (NRCS)	7.4%
Private Consulting Forester	38.1%
Consulting Firm or Company	6.9%
Timber Company	5.8%
Other	6.3%
I manage my forestland myself	45.0%
Number of Management Entities Involved (N = 189)	
One	82.5%
Two	11.6%
Three	4.8%
Four	1.1%
Lease their Land (N = 202)	
Yes	1.9%
No	98.1%

\*does not equal 100% as multiple options could be selected.

Table 4.5 shows the ranking of influences for management decisions. Regardless of management objectives, landowners ranked the following as important reasons for ownership: legacy for heirs (49.5%), timber income (46.7%), investment for children (46.5%), recreation (45.5%), and environmental stewardship (37%). Sources of revenue from other types of income (65.5%), hunting income (58.5%), and forestland adjacent to residence (56.5%) were not rated as highly important for these landowners. For those who reported they actively managed their land, legacy for heirs (51.2%), timber income (50.9%), investment for children (49.4%), recreation (46.5%), and environmental stewardship (37.2%) rated very highly. Importance of investment

for retirement and not wanting to clearcut were distributed fairly evenly across all importance categories for these landowners.

For landowners who did not actively manage, recreation (40.7%), legacy for heirs (40.7%), not wanting to clearcut (44.4%), environmental stewardship (37%), and emotional value (37%) were categories most often selected as very important. Income from non-hunting or timber (77.8%), hunting income (74.1%), land buffering residence (51.9%), recreation (40.7%), and investment for retirement (40.7%) were less important to these respondents. Interestingly, importance of timber for income was fairly evenly distributed among all choices while not wanting to clearcut, emotional value, and recreation were sharply divided between not important and very important.

A chi-square test was used to examine responses for significance between those who managed versus those that did not manage (Table 4.6). Timber income ( $p = 0.001$ ), investment for children ( $p = 0.040$ ), and environmental stewardship ( $p = 0.020$ ) were significant at  $\alpha = 0.05$ , while emotional value ( $p = 0.090$ ) was significant at  $\alpha = 0.1$  (Table 4.6).

**Table 4.5. Influences for management decisions for respondents to 2015 survey of forest landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama.**

Factors	Levels of Importance				
	Mean	Not Important	Slightly Important	Somewhat Important	Very Important
<b>Both Management and Non-Management (N = 200)</b>					
Timber Income	3.1	11.1%	13.1%	29.1%	46.7%
Hunting Income	1.8	58.5%	12.0%	18.5%	11.0%
Other Income	1.6	65.5%	16.5%	13.0%	5.0%
Investment for Retirement	2.5	25.0%	20.0%	31.0%	24.0%
Investment for Children	3.0	19.0%	8.0%	26.5%	46.5%
Environmental Stewardship	2.9	18.5%	11.0%	33.5%	37.0%
Land Buffering Residence	1.9	56.5%	15.0%	14.5%	14.0%
Don't Want to Clearcut	2.5	32.5%	12.5%	27.0%	28.0%
Emotional Value	2.8	21.0%	15.0%	28.0%	36.0%
Recreation	2.9	24.0%	8.0%	22.5%	45.5%
Legacy for Heirs	3.2	13.0%	7.5%	30.0%	49.5%
<b>Actively Manages (N = 172)</b>					
Timber Income	3.2	8.2%	11.7%	29.2%	50.9%
Hunting Income	1.9	55.8%	12.8%	18.6%	12.8%
Other Income	1.6	63.4%	16.9%	14.5%	5.2%
Investment for Retirement	2.6	22.1%	21.5%	31.4%	25.0%
Investment for Children	3.1	15.7%	7.6%	27.3%	49.4%
Environmental Stewardship	2.9	15.1%	12.8%	34.9%	37.2%
Land Buffering Residence	1.8	57.6%	16.3%	14.0%	12.2%
Don't Want to Clearcut	2.5	32.6%	13.4%	29.1%	25.0%
Emotional Value	2.8	18.0%	15.7%	30.2%	36.0%
Recreation	3.0	20.9%	8.7%	23.8%	46.5%
Legacy for Heirs	3.2	12.2%	6.4%	30.2%	51.2%
<b>Does Not Actively Manage (N = 27)</b>					
Timber Income	2.4	29.6%	22.2%	25.9%	22.2%
Hunting Income	1.4	74.1%	7.4%	18.5%	0.0%
Other Income	1.3	77.8%	14.8%	3.7%	3.7%
Investment for Retirement	2.3	40.7%	11.1%	29.6%	18.5%
Investment for Children	2.4	37.0%	11.1%	22.2%	29.6%
Environmental Stewardship	2.6	37.0%	0.0%	25.9%	37.0%
Land Buffering Residence	2.1	51.9%	7.4%	18.5%	22.2%
Don't Want to Clearcut	2.7	33.3%	7.4%	14.8%	44.4%
Emotional Value	2.5	37.0%	11.1%	14.8%	37.0%
Recreation	2.6	40.7%	3.7%	14.8%	40.7%
Legacy for Heirs	3.0	14.8%	14.8%	29.6%	40.7%

Mean based four-point Likert scale. 1 being 'not important', 2 being 'slightly important', 3 being 'somewhat important', 4 being 'very important'.



**Table 4.6.  $\chi^2$  levels from Chi Square of factors to management and non-management of respondents to 2015 survey of landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama. (N = 199).**

Factor	$\chi^2$	p-value
Timber Income	15.8	0.00
Hunting Income	5.3	0.15
Other Income	3.0	0.39
Investment for Retirement	5.0	0.17
Investment for Children	8.3	0.04
Environmental Stewardship	10.2	0.02
Land Buffering Residence	3.4	0.33
Don't Want to Clearcut	5.6	0.13
Emotional Value	6.4	0.09
Recreation	5.6	0.13
Legacy for Heirs	2.8	0.42

Pine plantations represented 48.5% of the owned acres reported by respondents with mixed pine hardwood as the next highest, at almost 25% (Table 4.7). Hardwood plantations and “other” forest types were at 2% and 2.3%, respectively, of the respondent’s acres. Respondents indicated that the “other” forestland was typically openings or wetlands. Natural pine and natural hardwood forest types were reported at a modest 9.3% and 13.2%.

**Table 4.7. Forest type owned by respondents to 2015 survey of forest landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama. (N = 200).**

Response	Percent
Pine Plantation	48.5%
Natural Pine	9.3%
Hardwood Plantation	2.0%
Natural Hardwood	13.2%
Mixed Pine / Hardwood	24.7%
Other	2.3%

## Discussion and Conclusion

The number of forest landowners in Bibb, Hale, Pickens, and Tuscaloosa Counties to have timber under a long-term lease contract was very low with few respondents actually leasing

their land for timber in the study area. Possible reasons for these low numbers in the study area might be due to there being a potential aversion to indicating that there was a timber lease with a forest products company, or that timber leasing in Alabama is highly localized and not present in the study area. However, several respondents added to their survey that they, and past generations of their family, had lived on their land and leasing their land could lead to loss of control. Similarly, some respondents also stated that they felt that leasing could negatively impact activities and future use of the forestland by their children and grandchildren. One respondent wrote, “I have four grandchildren that need a place to carry their families as well as their friends.” Additionally, one respondent stated that his land had been previously leased but was no longer because he felt that he could benefit more by managing himself rather than leasing the land for timber.

McGill et al. (2008) found in West Virginia that 24% of landowners were willing to engage in leases. A potential reason though for this percentage is the lack of harvesting activity in McGill’s et al.’s study area. Timber leases are more dependent on timber industry mills needing to engage in timber leases with willing private landowners rather than as a way for NIPF landowners to find a market for their timber. Still in the absence of timber leasing, forest products companies are dependent on NIPF landowners’ management behavior and willingness to harvest. Several respondents noted their frustrations about timber markets particularly with pine markets. As a result, some of these respondents expressed “increasing interest in hardwood management”. Additionally, another respondent said that management (harvesting) was only considered when income is needed. One respondent wrote about a situation about being pressured to harvest, “A timber agent told me that I had better sell it (timber), because everything

was going to laminates and plastics. I told him that that was okay because my deer, turkey, and squirrels couldn't eat laminates and plastics so I'll just let it stay.”

Landowners in the southern United States are more likely to manage their forestland for timber production or multiple objectives that include timber production (Kaetzel et al., 2012). Likewise, Kaetzel et al.'s study showed that 40.7% of respondents from the Southeast that said they actively managed were motivated by timber income while only 22% of the respondents said that their management objectives were not motivated by timber income. Not surprisingly given the high importance for income from timber sales, roughly half of the forested acres reported across the Southeast and in our study are in pine plantation as they offer the potential for good financial returns (Fox et al., 2007).

While this survey mostly had respondents who owned over 100 acres of forestland, the average forest landholding in Alabama is slightly less than 50 acres (Zhang et al., 2008). Larger landowners are more likely to focus on timber production than landowners of smaller forested holdings who generally tend to have a wider array of objectives (Butler, 2006). Additionally, involvement of entities for management decisions as larger acreages is also more likely to be managed with assistance than smaller acreages (National Woodland Owner Survey, 2016). Given that only 38% of the respondents in this study are using the advice of private consultants reinforces studies such as Measells et al. (2005) that suggest landowners as a whole are underserved. Similarly, one respondent felt the economics of timber management in today's markets had “changed dramatically over the last 10 years and that many landowners were being left behind”.

With the lack of timber leases to ensure forest management practices that meets producer needs, the potential for NIPF landowners to be good sources of timber for mills in the future is

uncertain as landowners respond in varying degrees to incentives such as price change (Prestemon and Wear, 2000). Given the changes in forest industry, there is ever increasing importance of active small scale forestry (Zhang et al., 2008). A potential benefit for both mills and landowners could be to increase offerings of consulting services to NIPF landowners. This will not only to help guide NIPF land management decisions but will potential also benefiting mill input and supply.

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## **Chapter 5**

### **Conclusion**

In the last 20 years, many industrial forest owners in the United States have sold large portions of its forested landbase, with some estimates as high as 37 million acres transferred to new owners (Butler and Wear, 2011). This divestment has raised concern with regard to the social and ecological impacts of new owner objectives. Southern states have also felt the impacts of these changes. Between 1998 and 2008, roughly 2 million acres of industrial forestland in Alabama were sold to new owners; making it the second most effected state in the South behind Texas with 3 million acres (Butler and Wear, 2011). While the majority of research has identified reoccurring trends on a national or regional scale, studies at a county level can also help illuminate landscape characteristics and patterns (Butler and Wear, 2011; Clutter et al., 2005; Zhang et al., 2012; Randle et al., 2015). This current study outlines the forest history, changes in forest ownership, and landowner perceptions in four counties in west-central Alabama in three essays. While it only comprises four counties it provides insight into how local entities, such as forest product companies, REITs, TIMOS, and NIPF landowners, have influenced and reacted to changes in tax policy, markets, land sales, and philosophy of management in the both the past and the present.

## **Timber Barons**

In the first essay, the history of the Kaul Lumber Company is outlined, and provides an example of how taxes, policy, and public perceptions can influence the forested landscape.

Owned by John Kaul, one of the great timber barons of his time, the Kaul Lumber Company and the Kaul Land and Lumber Company flourished in the late 1800s and early 1900s with longleaf pine in the Central Pine Belt. However, it became evident that the current harvest levels could not continue without a significant change in land management.

Between 1905 and 1910, Kaul would work with foresters such as Franklin Reed and Dr. Hermann Chapman in an attempt to develop harvesting guidelines that would facilitate natural regeneration of longleaf pine and subsequently a second forest. This was a marked difference in the philosophy of most timber companies of the time. However, the Kaul Lumber Company would be slow to implement Reed's and Chapman's suggestions due a general disregard for forest regeneration and competing needs for agricultural lands.

Despite Kaul's best intentions, increased taxes in combination with declining timber markets and the potential for increased environmental regulations, such as the Capper Bill, would put increased pressure on the company to change not only its land management but its corporate structure as well. In response to the Revenue Act of 1926, the Kaul Lumber Company changed its status from an Alabama corporation to a Delaware corporation for the purpose of lowering taxes. However, this was not enough. The onset of the Great Depression would ultimately cause the company's mill in Kaulton to close its doors, and sale of the Kaul property as well. Upon closer examination, it becomes clear that factors similar to the ones that the Kaul Lumber Company faced in the early 1900s such as market decline, loss of profits, and tax policy



were often echoed in forest industry's decision to sell large parts of its landbase in the 1990s and 2000s.

### **Technology and Taxes**

The second section of this thesis examines the outcome of industrial forest owners divesting of roughly 225,000 acres or 10% of all acres within Bibb, Hale, Pickens, and Tuscaloosa Counties, Alabama between the years of 1984 and 2014. Using county tax records and Landsat satellite imagery it was estimated that REITs and TIMOs would acquire 27,100 acres (6.7%) and 113,675 acres (28.1%), respectively, of the divested forest industry forestland during this period. However, while former forest industry made up 75.3% and 61.2% of newly acquired REIT and TIMO land, respectively, both entities also purchased large amount of lands from non-industrial owners.

It is interesting to note that not all industrial forest owners divested their forestland in the study area during this time. For instance, International Paper, headquartered in Memphis, Tennessee, sold the entirety of their landbase in 2006 through 2008 while the more local Westervelt, headquartered in Tuscaloosa, Alabama, acquired more land than it sold despite both being large vertically integrated forest products companies. Other smaller, family owned companies reacted differently as well with some companies showing little divestment of land, others selling parts of their land for real estate development, while still others disappeared completely.

Harvest activity of these new owners was also examined. Acres harvested for forest industry remained relatively stable between 1984 to 2008 and then declined from 2008 to 2014 despite forest industry losing over half its landbase from the late 1980s and early 1990s. REIT

harvested acres in the study area were limited as Weyerhaeuser, the only REIT in the region, did not convert its tax structure until 2010. TIMO harvested acres showed an increase from 1984 to 2011 with a slight decline from 2011 to 2014. This study also determined that within 1 to 5 years there was a 50% probability that a TIMO would harvest an acquired tract of timber. This increased to roughly 90% probability of harvest within 1 to 10 years from when the tract was acquired. This behavior could have serious ecological implications in the future due to increased fragmentation rates and landscape composition (Bliss et al. 2010, Wear et al., 2007).

In general, there is also concern about land use, forest conversion, and parcelization associated with REITs and TIMOs (Clutter et al., 2005). This study found that all entities, forest industry, NIPF landowners, REITs and TIMOs are taking advantage of higher and better use opportunities for their land. Population changes by county were shown to be significantly correlated with total changes in parcels of former forest industry companies' forestland (Pearson's  $R = .959$ ,  $P = .04$ ). However, these changes are highly localized, particularly around the city of Tuscaloosa and surrounding areas such as the Black Warrior and Sipsey River. Higher and better use, such as real estate, is not always a viable option in every scenario. However, it should be noted that over time with population increases, and expanding city limits, additional tracts of land might transition from forestry to "higher and better use" forms of real estate.

### **Landowner Motivations and Needs**

NIPF landowners acquired 79,337 acres or 19.6% of forest industry forestland in the counties in this current study. While NIPF landowners showed varying ranges of harvested acres, NIPF landowners consistently harvested more acres than forest industry, REITs, and TIMOs

combined from 1984 to 2014 per harvest detection interval. However, these NIPF landowners are assumed to largely harvest based on their own unique objectives.

The final chapter of this thesis examines forest management and attitudes of landowners in the study area. A survey conducted of landowners in these counties resulted in a response rate of 26% or 243 completed surveys from a sample size of 929 individual landowners who owned 100 or more acres in the counties of interest. Results of this study showed that only 2% of the respondents leased their timberland to outside entities for management. Additionally, roughly 84% of respondents stated that they actively managed their timberland. Factors such as timber income, investment for children, recreation, legacy for heirs, and environmental stewardship ranked high as important influences for management. However, only 38.1% of the respondents stated that they use a private consulting forester while an additional 12.7% stated they use consulting firm or timber company to help them with land management. Number from this survey suggest that approximately half of landowners in the region are managing their forestland on their own. Others landowners seem to indicate that they are not actively managing their forests because they do not know what to do or do not think it is financially feasible. We must then question what these attitudes could mean for future forest supplies.

Part of the reason for forest industries' divestment was the philosophy that forestland ownership was unneeded due to an expansive and readily available timber supply (Hickman, 2007). It is then critical that we understand the needs and objectives of NIPF owners in an attempt to better serve them ecologically and economically. There are opportunities for natural resource professionals (NRPs) working in agencies such as Alabama Cooperative Extension, the Natural Resource Conservation Service, and the Alabama Forestry Commission to reach out to these landowners to better understand their land management needs. It is important, too, that

NRPs understand the needs of forest products companies so that they can help non-industrial owners grow products that are needed to meet demand. Topics such as forest measurements, silviculture, silvics, and forest products marketing should be part of future continuing education courses in this region.

Overall, the general trend of the mass divestment of forest industry forestland and the majority of the new landowners are REITs and TIMOs are fairly consistent within the study area (Zhang et al., 2012). However, similar to Randle et al. (2015), some locally invested companies such as Westervelt maintained the majority of their forested landbase in the region. To a greater extent, the impact that these companies' decisions, to sell or to stay, have had short-term impacts such as the myriad of new forestland owners. However, the long-term impacts that these decisions will have on the forested landscape and their associated communities that depend on them still need to be monitored.

The methods employed in this study could be replicated in other areas to look for similar instances of forestland change. As tax county assessor offices are increasingly making tax records and parcel data more widely available in the form of shapefiles or interactive webpages, documenting landownership changes should become easier to access and manage in the future. In addition to this, satellite imagery is readily available and rapidly improving particularly in conjunction with improved remote sensing techniques that allow for harvest detection and forest classification. When combined, parcel data and satellite imagery can provide a relatively inexpensive and robust way to monitor landscape changes by landowner types. By employing this method in other areas, current and future trends can be assessed in multiple regions and over larger areas.

Improvements to this method and to this study would be a more robust analysis of forest changes such as the incorporation of fragmentation indices by landowner type and side-by-side comparisons of landownership changes of multiple regions. Future studies could involve the development of predictors for changes in parcelization, land use conversion, and fragmentation associated with landownership changes. Additionally, these same predictors might be able to applied to predict where landownership and forest change might occur and if that change would be of conservational concern.

This study has helped to document the effects of the divestment of forest products industry land and the onset of its new landowners. Secondly, this study is a growing body of research that is showing that local trends of these landowner changes each contain a unique perspective and context. In Alabama, a state so closely tied to and dependent on forestry, it is important that we continue to assess, understand, and react to these dynamic landowner shifts that have occurred and possibly will continue to occur.

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## Appendix A – Pre-notice Letter



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
3301 Forestry and Wildlife Sciences Bldg.  
Auburn University, AL 36849  
Email: rjb0003@auburn.edu  
Phone: 334.844.1019

August 10, 2015

Dear Forest Landowner,

I am writing to ask for your help with an important study being conducted by Auburn University to understand leasing of forestlands for timber management in the west-central area of Alabama. In a few days, you will receive a request to participate in this project by answering questions on if and how you lease your forestlands for timber management. The information will be used to help us better understand the landowner and forest industry relationships and dynamics. A better understanding of how you use your forestland will help identify future challenges and opportunities in landowner and forest industry relationships.

I would like to do everything that I can to make it easy and enjoyable for you to participate in the study. I am writing in advance because many people like to know ahead of time that they will be asked to fill out a questionnaire. Further information will come attached to the questionnaire.

I hope you will take your time to help us. This research can only be successful with the generous help of people like you.

Sincerely,

A handwritten signature in blue ink that reads 'Rebecca J. Barlow'.

Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
Alabama Cooperative Extension System

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## Appendix B – Survey Letter



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
3301 Forestry and Wildlife Sciences Bldg.  
Auburn University, AL 36849  
Email: rjb0003@auburn.edu  
Phone: 334.844.1019

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMATION LETTER  
for a Research Study entitled  
*“Leasing of Forestland for Timber Management in West-Central Alabama”*

August 14, 2015

Dear Forest Landowner,

**You are invited to participate in a research study** to obtain more information on the practice of leasing forestland for timber management in the west-central Alabama. The study is being conducted by Dr. Rebecca J. Barlow, Alabama Cooperative Extension System Specialist, in the Auburn University School of Forestry and Wildlife Sciences. You are invited to participate because you are a forestland owner and are age 19 or older.

**What will be involved if you participate?** If you decide to participate in this research study, you will be asked to fill out the enclosed questionnaire reporting costs of forestry practices in your area and return your responses in the postage-paid envelope provided. If you would prefer, responses may also be emailed to me using the address above. Your total time commitment will be approximately 10-15 minutes depending on the availability of your information. If you do not own forestland, please answer only Question #1 and return the questionnaire in the postage-paid envelope.

**Are there any risks or discomforts?** The risks and discomforts associated with participating in this study are minimal but may include taking an extended period of time to complete the survey.

**Are there any benefits to yourself or others?** If you participate in this study, you can expect information obtained through your participation to be used to fulfill an educational requirement for a Master’s of Science student in the School of Forestry and Wildlife Sciences at Auburn University, published in a professional journal, and/or presented at a professional meeting. Additionally, you can also help identify future opportunities and challenges within your forested landowner community. I cannot promise you any or all of the benefits described will be received.

**Will you receive compensation for participating?** No, there is no compensation for completing this survey.

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**Are there any costs?** If you decide to participate, costs should be minimal. Postage-paid return envelopes are provided for your use. The primary cost to you will be in time expended to complete the survey.

**If you change your mind about participating,** you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the School of Forestry and Wildlife Sciences, or Alabama Cooperative Extension System.

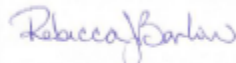
**Any data obtained in connection with this study will remain anonymous.** We will protect your privacy and the data you provide by never connecting your name to your responses once it is returned to us and all responses are summarized. We ask that you do not write your name or other information associated with you or your business on the questionnaire.

**If you have any questions about this study,** please call Dr. Becky Barlow, by telephone at (334) 844-1019 or by email at [rjb0003@aces.edu](mailto:rjb0003@aces.edu).

**If you have any questions about your rights as a research participant,** you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at [IRBadmin@auburn.edu](mailto:IRBadmin@auburn.edu) or [IRBChair@auburn.edu](mailto:IRBChair@auburn.edu).

**HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.**

Sincerely,



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
Alabama Cooperative Extension System

## Appendix C – Questionnaire



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
3301 Forestry and Wildlife Sciences Bldg.  
Auburn University, AL 36849  
Email: rjb0003@auburn.edu  
Phone: 334.844.1019

### Leasing of Forestland for Timber Management in West-Central Alabama

Your answers to this survey will help us understand landowner objectives and motivations, and how outreach services can better help landowners manage their forestland.

Thank you in advance for completing this survey. Your responses will remain anonymous. If there are questions you prefer not to answer, that is fine – just leave them blank.

1. Please indicate in which county/counties you currently own forestland? (*Check all that apply*)

- Bibb
- Hale
- Pickens
- Tuscaloosa
- None of the above → *Thank you for your response. Please return the survey in the enclosed self-addressed stamped envelope.*

2. How many acres of forestland do you own in each county? (*Please round to the nearest acre*)

Bibb \_\_\_ acres  
Hale \_\_\_ acres  
Pickens \_\_\_ acres  
Tuscaloosa \_\_\_ acres

3. In which county is your main residence? (*Please put a check mark in the space provided*)

Bibb \_\_\_  
Hale \_\_\_  
Pickens \_\_\_  
Tuscaloosa \_\_\_  
I do not reside in any of these counties \_\_\_

4. Do you actively manage your forestland, either personally or through the services of others? (*Management would include activities, such as but not limited to planting/regeneration, thinning, prescribed burning, fertilization, or harvesting*)

- Yes
- No

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5. Do you currently have another party that assists with the management your forestland?

- Alabama Forestry Commission (AFC)  
 Natural Resources Conservation Service (NRCS)  
 Private Consulting Forester  
 Consulting Firm or Company → *Please specify* \_\_\_\_\_  
 Timber Company → *Please specify* \_\_\_\_\_  
 Other → *Please specify* \_\_\_\_\_  
 I manage my forestland myself

6. Do you currently lease your land to a 3<sup>rd</sup> party for **timber management**?

- Yes,  
 No → Please proceed to Question 9.

7. Do you have 2 or more lease contracts for various parts of your forestland for **timber management**?

- Yes, I have 2 or more lease contracts  
 No, I don't have multiple lease contracts

8. When did your lease begin and when does your lease terminate? (*Please round to the nearest year. If you have multiple leases please list them separately in the spaces provided or on the back of the page if you don't have enough room*)

- a) Lease start date \_\_\_\_\_ <> end date \_\_\_\_\_  
 b) Lease start date \_\_\_\_\_ <> end date \_\_\_\_\_  
 c) Lease start date \_\_\_\_\_ <> end date \_\_\_\_\_

9. Please rate the importance of the following factors in making general management decisions about your forestland regardless if you lease your land. (*Check one for each*)

**IMPORTANCE FOR DECISION**

	None	Slight	Some	Very
a. Income from timber sales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Income from hunting lease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Income from other activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Investment for retirement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Investment for children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Environmental stewardship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Land buffering residence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Don't want to clearcut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Emotional value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Personal recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Leave a legacy for heirs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. What percent of each forest type would be best describe your forestland?

- \_\_\_\_\_% Pine Plantation                      \_\_\_\_\_% Natural Pine  
 \_\_\_\_\_% Hardwood Plantation              \_\_\_\_\_% Natural Hardwood  
 \_\_\_\_\_% Mixed Pine and Hardwood        \_\_\_\_\_% Other → *Please specify* \_\_\_\_\_



## Appendix D – Post-notice Letter



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
3301 Forestry and Wildlife Sciences Bldg.  
Auburn University, AL 36849  
Email: [rjb0003@auburn.edu](mailto:rjb0003@auburn.edu)  
Phone: 334.844.1019

August 28, 2015

Dear Forest Landowner,

Several days ago you received a brief survey about leasing of forestlands for timber management for west-central Alabama.

I am writing again because of the importance that your responses have for helping to get accurate results. If you have already completed and returned the questionnaire, thank you. We rely on research participation from people like you to help guide outreach programming statewide.

A few people have told me that they should not have received the survey because they do not own forestland. If this applies to you, please answer only Question #1 and return it by September 21, 2015.

If you have already completed the questionnaire, thank you! If not, I hope that you will fill out and return the questionnaire by September 7, 2015, but if for any reason you prefer not to answer it, please let me know by returning a note or blank survey. If you have any questions about this survey, please feel free to contact me by telephone at (334) 844-1019 or by email at [rjb0003@aces.edu](mailto:rjb0003@aces.edu).

Sincerely,

A handwritten signature in blue ink that reads 'Rebecca J. Barlow'.

Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
Alabama Cooperative Extension System

**HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.**

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## Appendix E – 2<sup>nd</sup> Survey Letter



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
3301 Forestry and Wildlife Sciences Bldg.  
Auburn University, AL 36849  
Email: rjb0003@auburn.edu  
Phone: 334.844.1019

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INFORMATION LETTER  
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August 28, 2015

Dear Forest Landowner,

**You are invited to participate in a research study** to obtain more information on the practice of leasing forestland for timber management in the west-central Alabama. The study is being conducted by Dr. Rebecca J. Barlow, Alabama Cooperative Extension System Specialist, in the Auburn University School of Forestry and Wildlife Sciences. You are invited to participate because you are a forestland owner and are age 19 or older.

**What will be involved if you participate?** If you decide to participate in this research study, you will be asked to fill out the enclosed questionnaire reporting costs of forestry practices in your area and return your responses in the postage-paid envelope provided. If you would prefer, responses may also be emailed to me using the address above. Your total time commitment will be approximately 10-15 minutes depending on the availability of your information. If you do not own forestland, please answer only Question #1 and return the questionnaire in the postage-paid envelope.

**Are there any risks or discomforts?** The risks and discomforts associated with participating in this study are minimal but may include taking an extended period of time to complete the survey.

**Are there any benefits to yourself or others?** If you participate in this study, you can expect information obtained through your participation to be used to fulfill an educational requirement for a Master's of Science student in the School of Forestry and Wildlife Sciences at Auburn University, published in a professional journal, and/or presented at a professional meeting. Additionally, you can also help identify future opportunities and challenges within your forested landowner community. I cannot promise you any or all of the benefits described will be received.

**Will you receive compensation for participating?** No, there is no compensation for completing this survey.

The Alabama Cooperative Extension System (Alabama A&M University and Auburn University) is an equal opportunity educator and employer.

[www.aces.edu](http://www.aces.edu)

**Are there any costs?** If you decide to participate, costs should be minimal. Postage-paid return envelopes are provided for your use. The primary cost to you will be in time expended to complete the survey.

**If you change your mind about participating,** you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the School of Forestry and Wildlife Sciences, or Alabama Cooperative Extension System.

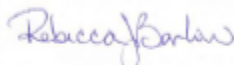
**Any data obtained in connection with this study will remain anonymous.** We will protect your privacy and the data you provide by never connecting your name to your responses once it is returned to us and all responses are summarized. We ask that you do not write your name or other information associated with you or your business on the questionnaire.

**If you have any questions about this study,** please call Dr. Becky Barlow, by telephone at (334) 844-1019 or by email at [rjb0003@aces.edu](mailto:rjb0003@aces.edu).

**If you have any questions about your rights as a research participant,** you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at [IRBadmin@auburn.edu](mailto:IRBadmin@auburn.edu) or [IRBChair@auburn.edu](mailto:IRBChair@auburn.edu).

**HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.**

Sincerely,



Dr. Rebecca J. Barlow  
Forestry Extension Specialist  
Alabama Cooperative Extension System