Acknowledgements

“Though my children shall roam through the forest, pursued by bruin, boar and serpent, I shall fear no evil, For God lives in the forest not the streets.” Latimer (Dad)

I would thank my family, (Donna, Johny, Bill, Lisa, Willie, Karin, Arlene, Betty, Roy and Kristal) and my friends, (Cody, Chris, Samantha, Paul, Dave, Louis and Ted) for supporting me throughout the process of pursuing my master’s degree. A special thanks goes out to Marsha Hernandez who helped with to editing this thesis. Without my family and friends, my life would have no meaning. My parents made sacrifices to ensure that I finished my education and for that I am eternally grateful. I would like to thank my former shipmates (Erin, Ron, Nic, Tim and Tom), and especially Andy Walden, who became my family away from home, and who looked out for me when I was young and taught me self-discipline and honor. I would like thank my advisor Kent Mathewson, and my other committee members Craig Colten and Miles Richardson, for raising my understanding of the world to a higher degree and giving me the opportunity prove myself in the academic community.
Preface

I always wanted to write something about Louisiana. I love Louisiana. I love our culture, and the inherent uniqueness of the state. Growing up in Louisiana has instilled in me an appreciation of the remarkable beauty of its land, its people, and its culture. I remember the first times I saw a sinker barge moving down the bayou. I was fourteen and I saw the barge from a bridge steaming on Chinquapin Canal in lower Livingston Parish. At the time, I wasn’t aware of Louisiana’s cypress history, but I was nonetheless fascinated by the barge. A few years later, I was knee boarding on the Natalbany River and I saw another barge docked on the bank. The recurrence of this cultural image prompted me to begin my exploration of sinker cypress. As a graduate student in geography, I could finally marry my passion for the bayou with my formal academic education. Throughout the course of this research, I have had the privilege to interview people involved in all aspects of this pursuit, from government officials whose job is to protect the environment to swampers who live and work in that environment. I have had the opportunity to see both the ecological protection and the economic productivity sides of the situation. Sinker cypress is a small industry, but many Louisianans have at least a cursory knowledge of it. My goal in this thesis is to explore the industry and attempt to provide a holistic presentation of the subject.
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Abstract

Sinker cypress (*Taxodium spp.*) logs are timbers that were lost during transit from harvest locations in the swamps and mill sites during the industrial cypress harvest from 1880-1930. A small industry has developed, concentrated on the recovery of sinker logs. Most of the persons involved in the recovery of sinker cypress, mill the logs into lumber, and sell the timber directly to consumers or to distributors. A smaller number of pullers retain the logs for personal use. Recovery operations are a costly endeavor and require a significant investment on the part of the harvesters. Most pullers are owner/operators who do not use profits from log sales as a primary source of income.

The federal and state governments have enacted policies and regulations to prevent negative impacts on the ecosystems around recovery locations. Persons who harvest sinker cypress logs must apply for permits to remove sinker cypress from waterways. Sinker cypress recovery is cost and labor intensive. The preferred methodology of finding logs is to don diving gear and feel for logs in the mud on the bottoms of rivers and streams.

This study was conducted in south Louisiana and conclusions were based primarily on personal interviews and legal studies. There is a spatial relationship between the cultural identity of south Louisiana and cypress. South Louisiana is a source of sinker cypress and the majority of people who purchase the wood live in region. The wood is also used on a smaller scale in restoration projects in the United States in order to maintain consistent wood grain matching.
Chapter 1

Introduction

What Is Sinker Cypress?

Sinker cypresses are those logs that were lost during transit to mill sites after their harvest from the swamps during the age of industrial cypress logging. Cypress was harvested in all regions of the southeast United States where the tree grew in abundance. The focus of this thesis is to study the process of removing these lost timbers from the bottoms of Louisiana waterways. The following chapters will address the questions of how the logs found their way to the bottoms of bayous, what makes cypress wood special, what steps have been taken to protect the environment, and why people recover underwater timber. Underwater log salvage is not limited to the South or to cypress alone. The industry is not cypress specific and is widespread. Log salvage emerged during the latter half of the 1800s when logs sank during raft transport during the industrial harvest of timber across the United States (Cayford 1964).

Sinker Cypress and Its Relationship to Geography and the Environment

To understand this concept we must understand geography and the environment. What is geography? Geography is many things to many people. For the purpose of this study, geography is the study of spatial relationships, where things are and why phenomena are happening there. The geographical relationships can involve both physical and human geography. We are one discipline bound together by asking the questions of where things are happening and why. I call myself an environmental geographer, meaning I study environmental phenomena from the perspective of geography, specifically in the context of space and place, the relationship of the issue to the concept of the cultural landscape, physiography and use of social theory as a tool for understanding why things are happening at a location.
What is environmental geography? Environmental geography is the application of geographical methodology to understand environmental issues from a spatial perspective. Environmental geography concerns itself with land and resource uses and how they may be understood spatially. The definition is specific to this study and is subject to change as my understanding of geography develops. No scholar will ever completely agree or disagree with any definition or model, which is why I have chosen to develop my own definition for the study. We would be remiss in our duty as scholars not to be critical and find flaws in any blanket statement, but I feel this definition is close to my understanding of what the term *environmental geography* should mean. Traditionally, environmental geography focused on hazard studies, the relationship of man and hazards/resources (Kates 1987). Hazard studies include, but are not limited to, environmental perception, risk assessment and climate impact assessment (Kates
Another term sometimes used interchangeably with the term environmental geography or sometimes called environmental management is landscape ecology. Landscape ecology is the study of the relationships between the biosphere (environment) and the anthroposphere (landscape) (Vinks 1983). Landscape ecology is a “spatially explicit” science whose approach to environmental studies is at its heart geographical (Vinks 1983).

What is the environment? Cunliffe wrote, “Environment is to landscape as space is to place” (Cunliffe 2000: 111). “Environment’ generally refers to our material surroundings, above all to those we regard as natural” (Lowenthal 2000: 200). Environment and landscape are two sides of the same coin. Carl Sauer spoke of the natural landscape and the cultural landscape. Times have changed, and what he called the natural landscape I call the environment and what he defined as the cultural landscape I simply call landscape. The natural landscape or environment is “known through the totality of its forms” (Sauer 1925: 337) to include the geognostic factors of climate and vegetation plus time to create forms influenced climate, land features (mineral resource, soil, drainage, surface features), its proximity to the sea and vegetation (Sauer 1925). The use of the word environment in today’s communicative context is used more to describe nature or ecological impacts and less to describe culture. Understanding the dichotomy of landscape and environment is best understood by approaching an ecological issue from two perspectives: one by looking at an issue in terms of culture is landscape and two by examining an issue from the perspective of nature is referred environment. Sometimes the issue is confusing and the lines are fuzzy and in certain instances the terms are used interchangeably for one another. The environment is “…process of change in the physical and natural resources of a region – climate, soil, fertility, flora and fauna- viewed independently of the way it is conceived of by the human inhabitants at any particularly point in time” (Morphy and Flint 2000: 5).
What is the landscape? “The cultural landscape is fashioned from the natural landscape by a culture group” (Sauer 1925: 343). Landscape is “that segment of Earth space which lies between the viewer’s eye and his or her horizon” (Salter 1978: 71) “…every landscape is a piece of the Earth as the home of man” (Meinig 1979: 35). These three statements have one significant thing in common: culture (Humanity) often views the world in the terms of landscape.

What Is the Relationship between the Environment, Landscape and Sinker Cypress?

“Geography is based on the reality of the union of physical and cultural elements of the landscape” (Sauer 1925: 325). In the case of sinker cypress, the logs represent the physical element and the “pullers” and their lifestyle represent the culture. “The environment we inhabit is inseparable from human culture” (Morphy and Flint 2000: 1). The baldcypress is the state tree of Louisiana; it is part of who we are. We use the baldcypress as symbol for our identity, its distinct features representing our own atypical ways as Louisianans of viewing the world. Sinker cypress represents our heritage. Sandra Ellegard, a manager at Porters of Racine (an upscale furniture store in Racine, Wisconsin. that retails sinker lumber), stated “…people are captivated by the romance of owning something from another era” (Kaiser 1997). The largest sources of customers who purchase sinker cypress reside in south Louisiana (Doolittle 2005). It is less because of the resilience of the wood to decay and more to have a true part of Louisiana’s identity in their home. Lowenthal wrote “Our own environments…are uniquely precious; as unlike all others” (Lowenthal 2000: 198) and “Each people treasures physical features felt to be distinctly their own. Landscapes are compelling symbols of our national identity” (Lowenthal 2000: 198). When I think of south Louisiana, I think of cypress. Cypress is a symbol of our culture, our lifestyle, a physical expression of who we are. Sinker cypress is a representation of our history. I strongly feel, upon the completion of many detailed discussions with people who are involved in the industry, that when people use sinker cypress to construct homes, build
furniture or use it as a medium for a creative outlet, they are using sinker cypress to symbolize their identity and reinforce their ties to our state and our lifestyle.

The world we live in differs from the days of industrial cypress lumbering, where the school of thought was “get in, cut it and get out.” The position of modern society regarding cypress harvest is focused towards more ecologically sound practices. The pressures of society have forced the government to take steps that protect the environment. To harvest sinker cypress, the “puller” must meet standards set forth by the legislature to ensure the minimization of any degradation to the environment. The puller, usually, has to operate on a small budget with an average of a one or two person crew and coordinate their efforts to reduce operating costs (gasoline, food, diving equipment) and maximize the number of logs removed. It is a small industry and the work is difficult. During the course of my research I have found few academic studies on the subject and most of my research was conducted by interviewing participants in all phases of the process from the pullers themselves to the persons directly involved with the permitting procedures.
Chapter 2

Botanical Characteristics and Physiography of Cypress

Physiography: the study of physical features of the Earth’s surface. The story of cypress and its relationship in the context of sinker reclamation begins with the germination of a cypress conelet and ends with felled logs arriving at the mill. In this chapter I will address the life cycle biology of cypress, the ecological relationships between cypress habitats and the environment, pests of cypress, the commercial uses and grading of lumber and how industrial nomenclature is used to describe biological characteristics of cypress timber.

General Species Description

Cypress is a deciduous (sheds leaves) conifer (cone bearing gymnosperm) (Platt 1965). There are three species of cypress that are found in North America: baldcypress (*Taxodium distictum*), Mexican-cypress or Montezuma balcdypress (*Taxodium mucrunatum*) and pondcypress (*Taxodium ascendens*) (Brown and Montz 1986). Cypress is a large tree maturing at heights of one hundred to one hundred and fifty feet (Little 1996). Older cypress trees average three to five feet diameter at breast height (DBH) (Mattoon 1915). Cypress is a polymorphic species and can grow in a multitude of variations of a central theme. Bases of cypress may be tapered or conical, bottle-shaped or truncated (Brown and Montz 1986). Cypress boles may develop large flutes under certain growing conditions. Mature tree bases tend to develop a cylindrical base over time (Brown and Montz 1986). Maximum observed basal diameter has been observed in excess of seventeen feet (Mancil 1972). Older stands of cypress are readily apparent due to the self-pruning nature of the species (Sheets 2003). After years of self-pruning cypress trees will have little or no lower branches and a flat crown of limbs at the top of the stem.
Physiography

The natural distribution of cypress in the United States includes much of the region traditionally known as the South. Cypress is classified as an obligate wetland species (Tiner 1993), meaning it is always found occurring naturally on wetland sites. It occurs in swamps, streamside, and permanent/frequent flooded locations (Tiner 1993). Within its climatic range, cypress is found growing naturally as far north as Delaware and as far south as the southern tip of Florida along the eastern seaboard (Little 1996, Brown and Montz 1986). The range continues west along the Gulf coast into southeast Texas well out into central Texas (Brown and Montz 1986). Within the interior, cypress can grow as far north as southern Illinois and as far west as eastern Oklahoma. Over half of Arkansas is within the growing region of cypress (Little 1996). Pondcypress (*Taxodium ascendens*), the only cypress species other than baldcypress (*Taxodium distictum*) that grows within the aforementioned region, is restricted to the Gulf and Atlantic coastal plains, growing only as far west as eastern Louisiana and as far north as southern Virginia (Brown and Montz 1986). Montezuma cypress is restricted to mainly to Mexico and Central America, particularly within the borders of Guatemala and Mexico and in extremely small and localized regions in lower borderland Texas (Brown and Montz 1986).

The distribution of cypress is confined within the region classified as Cfa by the Koppen-Gieger climate classification system (Bigg 1996). Cfa regions are characterized as humid subtropical, without dry seasons and hot summers (Bigg 1996). Further descriptions are that the regions are mid-latitude, rainy with mild winters (Bigg 1996). The coolest months typically range in temperatures averaging 26.6 degrees to 64.4 degrees Fahrenheit while the temperature of the warmest summer month averages greater than 71.6 degrees Fahrenheit (Bigg 1996). The minimum observed temperature for baldcypress survival is – 34 degrees Celsius (-11.2 Fahrenheit) (Wilhite and Toliver 1990).
Figure 2: 100-year-old pure stand Tangipahoa Parish.
Figure 3: Old growth cypress East Baton Rouge Parish
Figure 4: Baldcypress and pondcypress range map (pondcypress outside the dashed line)
Figure 5: Tree regions of Louisiana
Source: Louisiana Department of Agriculture and Forestry.

1. Shortleaf Pine-Oak-Hickory Region.
2. Longleaf Pine Region.
3. Bottomland Hardwoods and Cypress Region.
4. Upland Hardwoods Region.
5. Prairie Region.
6. Marsh Region.
Cypress may be found growing on a variety of soils including Spodosols, Ultisols, Inceptisols, Alfisols, Histosols, Mollisols and Entisols (Coultas and Duever 1984). The soils temperature regime is characterized as thermic and hyperthermic (Coultas and Duever 1984). Cypress growth is found to be optimal on Piedmont (red water) soils and minimal on “black water” soils that contain high concentrations of organic matter on coastal plains. Maximum salinity concentration for cypress development is 0.89 percent for older stands and .003 percent for saplings (Wilhite and Toliver 1990). Mature cypress trees that develop in high salinity conditions have more tolerance to salinity than cypress that have not grown in high salinity conditions (USGS no date). Tolerance to salinity may be genetic, and are transferred to offspring (USGS no date). Freshwater cypress swamps are divided into two vegetative cover regions, baldcypress-tupelo swamps and pondcypress-swamp gum (Mattoon 1915). The topography of cypress distribution is usually flat with 90 percent of the species growing there naturally. Most trees inhabitat regions that are usually found in areas less than one hundred feet above mean sea level. Cypress has been observed growing at elevations of one thousand seven hundred and fifty feet above mean sea level in portions of Texas.

**Sexual and Vegetative Reproduction of Cypress**

Cypress is a monoecious species, meaning each plant produces male and female cones (Wilhite and Toliver 1990). Female cones are the larger of the two gender cones, usually maturing in the fall months of October to December (Wilhite and Toliver 1990). Female or ovulate cones are woody and globuse in shape and approximately one half to one and one half inches in diameter (Wilhite and Toliver 1990). Each female cone is composed of nine to fifteen four sided scales and contains an average of sixteen seeds per cone (Wilhite and Toliver 1990). Cones usually fall naturally but are often facilitated by squirrels feeding on the seeds (Wilhite
Figure 6: Geologic map of Louisiana (Note Pleistocene Terrace adjacent to swampland)
Source: Louisiana Geological Survey
and Toliver 1990). Seeds are usually heavy and wingless or found with small ineffectual wings and dissemination is provided via waterways or flooding of standing timber (Mattoon 1915).

Male cones “flower” during springtime throughout the months of April and May. Male cones are smaller and globuse and are racemic and panicle in nature (Wilhite and Toliver 1990). Pollen sacs are two-ranked. Pollen and ovulate cones are produced annually and “good” crops are reproduced every three to five years. Cones disintegrate upon maturing (Brown and Montz 1986). Distribution is often limited to the region surrounding the parent tree.

Vegetative reproduction is carried out by means of coppicing or stump sprouting. Sprouts from stumps of younger trees those under sixty years old are found to be more productive than trees whose age exceeds sixty years (Forder 1995, Mattoon 1915). Stumps as old as two hundred years may sprout, but survival of sprouts is severely decreased relative to younger stems (Mattoon 1915). Wind damage is a large contributor to sprout loss as the stump decays and leaves the stem exposed to weathering (Wilhite and Toliver 1990). Timbers harvested from sprouts are poorly developed and of much less quality than timber cut from stems born of sexual reproduction (Wilhite and Toliver 1990). Planting by means of cuttings, the use of small limbs planted in hopes of stem development, are more productive when the donor tree is less than five years old (Wilhite and Toliver 1990).

**Sapling Development**

Studies have postulated that cypress trees are not as old as previously considered. Most of the incorrect assumptions of the age of cypress are based on the premise of incorrect tree ring analysis as a method of determining age. Older interpretations of tree ring dating often placed cypress ages at far older estimations than they actually were. False rings caused by tree metabolism slowing during flooded site conditions leaves rings that are not true annual rings
Estimates for virgin cypress tree ages were exaggerated by as much as one and a half times the true age (Brown and Montz 1986). Virgin standing timber during the era of industrial harvest have now been more accurately dated as averaging four to six hundred years old (200-400 year old solid trees) (Van Deusen, Reams, Devall, Rochon and Dell 1993) while some older hollows timbers commonly referred to as snags may be approximated close to twelve hundred years of age (Wilhite and Toliver 1990).

Cypress continues vertical growth until approximately two hundred years reaching the height of one hundred and twenty to one hundred and sixty feet (Sheets 2003). Studies have shown that most one hundred year old stands, those that have regenerated after industrial harvest, are averaging one hundred and nine feet in height and 21.3 inches diameter at breast height (Williston, Shropshire and Balmer 1980). Another study of a twenty one year old site observed a growth rate of approximately a half-inch per year for cypress saplings (Krinard and Johnson 1976). Commercial densities of merchantable heartwood develop in sufficient quantities at the age of two hundred years.

Cypress regenerates well in open or direct sunlight growing at a rate near one foot per year (Williston, Shropshire and Balmer 1980). Black swamp, a term coined by old cypress men, is region of cypress swamp where the over head crown of cypress blocks most direct sunlight to the swamp floor leaving little or no mid or understory (Sheets 2003).

Older trees are susceptible to fungal attacks that decay the wood from the crown downward (Mattoon 1915). As a direct result of this phenomenon many of the current old growth cypress are hollow. Because of this, the trees were not considered marketable and were left standing. The suspect fungus is *Stereum taxodii*, the same fungus that cause the condition known as pecky cypress (Mancil 1972). Pecky cypress is a condition where fungal attacks create small, approximately one inch in diameter and several inches long, cavities in the heartwood. While not
considered valuable during the industrial harvest era, the cavities are now considered aesthetically pleasing and a market has developed to sell pecky cypress as paneling inside homes.

**Cypress Nomenclature**

Cypress nomenclature, particularly within the state of Louisiana, is a varied and confusing subject. Developing a clear understanding of the frequent names used by lumbermen to describe cypress is an arduous feat, which has taken this author several years to accomplish. First and foremost, readers should already recognize that there are only two species of cypress in Louisiana and many scientists debate even this: *Taxodium distictum* and *Taxodium ascendens*. Cypress timber of Louisiana is not even a true cypress tree and was named so, because of the similarities between members of the *Cupressus* genus and the *Taxodium* genus, hence why baldcypress is spelled with one word instead of two.

The varieties of names associated with describing cypress timber follow six distinct trends: species identification, geographic location, Native American, temporal or as a function of ecological succession, condition and color of inner wood and lastly the floating characteristics of felled logs. The Seminole peoples of Florida called cypress hatch-in-e-haw, which means, “wood everlasting” (Mancil 1972).

During the peak of industrial logging, timber harvesters had already begun to recognize that there are two separate species of cypress; pondcypress and baldcypress, growing naturally in Louisiana (Mattoon 1915). Efforts had been made by industry to delineate regions where both species reside. Baldcypress was determined, at the time from 1890-1930, to occur within seventy fives miles of the coastline (Mattoon 1915). Baldcypress and pondcypress grow in close proximity to each other in certain situations. During times of industrial harvest, harvesters use color to determine the differences between pond and baldcypress, the former having a lighter
Table 1: Cypress Nomenclature

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Regional or Characteristic</th>
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<tr>
<td>Gulf Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Blonde Cypress</td>
<td>Wood Color</td>
</tr>
<tr>
<td>Grey Cypress</td>
<td>Wood Color</td>
</tr>
<tr>
<td>Black Cypress</td>
<td>Wood Color/ Floats Low</td>
</tr>
<tr>
<td>Tidewater Red Cypress</td>
<td>Wood Color</td>
</tr>
<tr>
<td>Pondcypress</td>
<td>Species</td>
</tr>
<tr>
<td>Baldcypress</td>
<td>Species</td>
</tr>
<tr>
<td>Sea Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Marsh Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Florida Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Sinker Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>White Cypress</td>
<td>Wood Color/ Floats High</td>
</tr>
<tr>
<td>Louisiana Red Cypress</td>
<td>Wood Color</td>
</tr>
<tr>
<td>Yellow Cypress</td>
<td>Wood Color</td>
</tr>
<tr>
<td>Upland Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Swamp Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Southern Cypress</td>
<td>Location</td>
</tr>
<tr>
<td>Heart Cypress</td>
<td>Woody Center of Tree</td>
</tr>
<tr>
<td>Pecky Cypress</td>
<td>Wood Condition</td>
</tr>
<tr>
<td>Hatch-in-e-Haw</td>
<td>Seminole Name</td>
</tr>
<tr>
<td>Growback</td>
<td>Succession</td>
</tr>
</tbody>
</table>

yellow color and the latter having a more red heartwood color. Sinker cypress pullers feel that color is a function of soil conditions during stem development not a determinant of a particular species (Bassemier 2004). The following names are used to describe balcypress: gulf cypress, tidewater red, sea cypress, coast cypress and Louisiana red (Mancil 1972). Pondcypress was often called blonde cypress, yellow cypress, inland cypress and upland cypress (Mancil 1972).

Ecological succession, as it relates to the description of cypress timber, is used to describe the temporal portion of the cypress development lifecycle. The terms used to describe timber stands
are virgin cypress, old growth cypress and grow back cypress (often pronounced grow beck) (Sheets 2003). Virgin and old growth stands of cypress are those stands present at the genesis of industrial cypress lumbering whose ages have now been estimated at averaging between four and six hundred years old (Wilhite and Toliver 1990). Grow back cypress is a common name used to describe the second and third regenerative stock of cypress timber after the cut over of timber lands during industrial harvest (Sheets 2003). The oldest grow back timber is slightly over one hundred years old and does not have the decay resistant cypressene in high enough concentrations to warrant the cost of commercial harvest (Connor and Day 1976, Sheets 2003). For an unknown reason, during the course of research several interviewees were quite passionate about clearly making the point that “there is no such thing as grow back”. It is possible the source of the debate stems from the confusing of using the term grow back as a description of an individual species or as description of the temporal development of the species.

Floating characteristics of cypress had been described as conditions where the logs were positioned relative to the water line. Four terms were used: white cypress, black cypress, sinker, and deadhead (Mancil 1972, Mattoon 1915). White cypress, which was often used to describe pondcypress, had also been used to describe cypress logs that floated high in the water (Mancil 1972). Alternatively, black cypress was a term coined to denote a log that was less buoyant than most logs and floated much lower than other logs in the raft (Mancil 1972). Deadheads or sinkers, which have already been discussed in great detail, are those logs which did not float at all or had lost buoyancy and subsequently sank during transit to mill locations (Mattoon 1915).

Wood condition of the cypress tree is described as to the condition of inner marketable woods with respects to xylem density, fungal damage and color. Heart cypress is used to describe the xylem of older cypress stems that are large enough to use in commercial needs. Pecky cypresses, as described earlier in this chapter, are those heartwoods filled with cavities created by the
fungus *Stereum taxodii* (Mancil 1972). The wood of cypress has an abundance of different colors, often transitioning from green to gray, white to deep red and from dark chocolate to black. Mixed colors of heartwood have been found growing in close proximity to each other (Sheets 2003). Consumer interest as it pertains to color is as varied as the colors themselves. With regards to geographic location, cypress has been called Florida cypress and southern cypress (Mattoon 1915). As previously mentioned, cypress was described in geographic terms by using the seventy-five mile boundary as a method of species differentiation (Mattoon 1915).

### Cypressene

Cypressene is an oil found in cypress. Cypressene is the key to commercial cypress. There are few, if any, scholarly studies on oil itself, although there are often few brief mentions of it in trade articles. Cypressene is given credit for the incredible durability associated with marketable timber. Old growth and virgin cypress contained the highest concentrations of heartwood that is the source of cypressene. Sinker cypress logs retain much of the oil that was present during felling, even though it is considered to have lost a significant amount of oil during its tenure at the bottom of the bayou (Sheets 2004).

The amount of cypressene still present after recovery affects how durable the wood will be when exposed to environmental conditions. It has been observed by most of the persons interviewed, that cypress wood after it has been milled has an oily almost paraffin like texture to it (Sheets 2003). Most pests are not tolerant of high cypressene concentrations, and with the exception of the few fungi listed; the wood is usually well protected (Sheets 2003). Old growth cypress had a thin sap ridge (phloem or outer bark) and is small relative to the size of the heartwood. New growth cypress, sometimes known as second growth and grow backs, has a large sap ridge and small heartwood ratio and is far more susceptible to decay than the heartwood.
The heartwoods of the new growth cypress do not contain large enough concentrations of cypresene to warrant the cost of large-scale timber production. Older cypress trees are generally considered to have higher concentrations of cypresene. Trees that have darker colored and or red heartwood are considered to have more cypresene than yellow or white cypress (Sheets 2003). The cost of operating in wetlands and the relative low cost of pine production leaves little or no reason to harvest new growth cypress for timber. There is now a small industry that involves the milling of new growth cypress into mulch for commercial and private landscaping purposes. The red tint of cypress chip mulch is marketed to be aesthetically pleasing to consumers and has become increasingly popular. Sinker cypress logs are relics of a lost landscape. This landscape provided the world with vast amounts of quality baldcypress wood
that could stand the test of time. That landscape is now lost, and it will be hundreds of years before it will be seen and utilized again, but until then, sinker cypress is a tangible reminder. Because of the large size of old growth cypress timber and the high concentrations of cypresene that people are willing to go the extra distance, sometimes risking their lives, to retrieve this valuable timber.

**Grading Cypress Lumber**

The grading of cypress timber is a method used to maintain a commercial stratum between those cypress lumber products whose value is more marketable and those whose value is less desirable to the consumer. Although cypress is a conifer (softwood), it is marketed commercially as if it is a hardwood (Weaver and Anderson 1954). There are two schools of thought: one is that it can be graded and the other is that there is no grading of sinker cypress. I have noticed a trend (but it is not always the case) that buyers of sinker cypress (wholesalers and distributors) tend not to grade sinker timber, which allows for a more uniform product price, and those persons who are selling sinker cypress, (usually harvesters themselves), grade their product in hopes to get a better market value for their lumber. When cypress was harvested on a large industrial scale, there were seven grades of cypress. The Southern Cypress Manufactures Association, comprised of approximately fifty companies in 1915 established these grades (Mattoon 1915). These grades were tank, first and second clear, select, shop, select common tank stock, barn and dimension, and peck and cull (Mattoon 1915). Tank and first/second clear grades were used mostly for appearance applications (Mattoon 1915). Shop and common were general-purpose lumber products that could be used in trims and other finishing works (Mattoon 1915). Peck was not as desirable then as it is today and was graded along with cull timber (Mattoon 1915).

The cypress market of today is smaller and more simplified than is was a century ago. A hundred years ago nature had supplied an entire spectrum of cypress timber mostly because of
the abundance of the tree itself, which allowed for large variations in timber quality. Today the story is far removed from the timber qualities of yesteryear, with only four sources of cypress: undiscovered virgin stands, reclaimed cypress from old constructions, “new” growth cypress, and sinker cypress. As of 2005 the Southern Cypress Manufacturers Association (SCMA) uses reduced grading scales, which consist of five different grades. These are finished select and better, common (#1, #2, #3), shop (#1, #2, #3), peck (#1, #2), and timber (#1, #2, #3) (SCMA 2005). Select and better are used for appearance application much the same way tank was used, while common is now the general construction grade of cypress (SCMA 2005). The most frequent of grades used by industry are selects and better, #1 and #2 common, and #1 and #2 peck (SCM 2005). Red cypress heartwood is heavier and more durable than lighter (whites and yellows) heartwood (Sheets 2003).

Table 2: Cypress Grades

<table>
<thead>
<tr>
<th>1915</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank</td>
<td>Finished (Select and &quot;D&quot;)</td>
</tr>
<tr>
<td>First and Second Clear</td>
<td>Common (#1,#2,#3)</td>
</tr>
<tr>
<td>Selects</td>
<td>Shop (#1, #2, #3)</td>
</tr>
<tr>
<td>Shop (2)</td>
<td>Peck (#1, #2)</td>
</tr>
<tr>
<td>Selected Common Tank Stock</td>
<td>Timbers (#1, #2, #3)</td>
</tr>
<tr>
<td>Barn or Dimension</td>
<td></td>
</tr>
<tr>
<td>Peck or Cull</td>
<td></td>
</tr>
</tbody>
</table>
Figure 8: 20-year old cypress board walk (not yet rotted because of high cypresene content)
Cypress Pests

Cypress has an abundance of natural agents that are detrimental to the productivity and survival of the tree. These agents are characterized by the destructive nature in which they attack cypress: defoliation of leaves, feeding upon of sapwood and heartwood, consumption of saplings by herbivorous mammals, cone destruction and fungal attack.

Foliage damage most often occurs from the actions of moth larva feeding on cypress needles. Chief among these are fruit tree leaf roller (*Archips argyrospela*) (Brown and Montz 1986), bald cypress looper (*Anacamptodes pergracilis*) (Brown and Montz 1986) and bagworm (*Thyridopteryx ephemraeformis*) (Wilhite and Toliver 1990). Other detrimental cypress leaf agents include the cypress leaf beetle (*Systena marginalis*) (Brown and Montz 1986), red spider mites (*Tetranychus spp.*) (Mancil 1972), fall webworm (*Hyphantria cunea*) (R8-PR 16, 1999), and cypress gall (*Itonida taxodii*) (Brown and Montz 1986).

Beetle activity boring into the timber causes most sapwood and heartwood destruction. The southern cypress bark beetle (*Ploesinus taxodii*) (Mattoon 1915), heartwood borer (*Trachykele lecontei*) (Mancil 1972, Brown and Montz 1986), flat-footed ambrosia beetle (*Platypus compositus*) (Mancil 1972), flat-headed sapwood borer (*Acmaeodera pulchella*) (Brown and Montz 1986) and the cypress bark borer (*Physocnemum andreae*) (Mattoon 1915) are the primary sources of beetle damage. The flat-footed ambrosia beetle is particularly damaging to young timber, dying timber and felled logs that do not get milled within a couple of years.

Herbivore mammals’ feed upon Cypress saplings and shoots during the plants juvenile stages. The young shoots are succulent and easier for the animals to consume. Significant hazards, particularly in cases of reforestation, are nutria, (*Myocastor coypu*) (Wilhite and Toliver 1990) whose voracious feeding habits can destroy young seedling stock in a matter of days and weeks.
Other browsers of cypress seedling and sapling include the swamp hare (*Sylvilagus aquaticus*) and whitetail deer (*Odocoileus virginianus*).

*Fomes geotropus* (Brown and Montz 1986), *Daedalia spp.* (Mattoon 1915) and *Polyporus meliae* (Mattoon 1915) are fungi that had been at one time considered to be the cause of pecky cypress. It has since been confirmed that *Stereum taxodii* is the source of pecky cypress (Mancil 1972). After the fungus creates a cavity within the heartwood, microbial activity creates a change in gas composition and the fungus dies (Mattoon 1915). The conditions that allow for development of pecky cypress halts once the tree is felled and milled (Wilhite and Toliver 1990). Lastly, *Polymorphus amarus* (Brown and Montz 1986) is a fungus that attacks cypress timber. Not previously mentioned in literature, another offending insect is the bumblebee. An interviewee had a bee (species unknown) boring cavities into his ceiling, which was constructed of lumber milled from sinker cypress (Lobell 2005).

**Pondcypress**

Pondcypress has been the focal point of debate among botanists for many years. The debate is centered on three competing arguments: that pondcypress is a separate species, that it is a variety of baldcypress, and that it is the result of phenotypic plasticity (ecological variance) (Walterscheidt 1992). For the purposes of this thesis pondcypress will be considered a separate species, but only as a matter of preventing confusion towards the reader. Pondcypress is found naturally growing on wet sites that are not well drained and not regularly flooded unlike riverine sites and stream swamps. Soils at these locations are typically poorly drained and acidic and the combination of these two factors contributes to the argument of phenotypic plasticity (Brown and Montz 1986), (Wilhite and Toliver 1990). Pondcypress and longleaf pines are identifying species found in wet pine savannahs (pine flatwoods see appendix E).
Figure 9: Baldcypress (left) pondcypress needle (right)
The physical characteristics of pondcypress differ from baldcypress in the presence of appressed, scale-like needles and thicker almost blocky, gray to brown bark. Pondcypress is a medium sized tree. Pondcypress grows at a slow rate and is a small tree relative to size and growth rates typically found in baldcypress. Not all pondcypress are small, as I have been to sites adjacent to Lakes Ponchartrain and Maurepas Louisiana where the trees have attained heights close to fifty feet.

Much of the confusion associated with separating pondcypress from baldcypress stems from the issue that baldcypress and pondcypress could be found with appressed and spreading needles on the same tree. Since the separation of species is a cloudy debate at best, it is impossible at the time of writing for this researcher to inform sinker cypress harvesters which species of cypress they are raising. The only answer I can provide is that during the industrial harvesting era, upland cypress was mostly associated with what is now known as pondcypress and the heartwood of those timbers were described as having a less red and more blonde to white color.

Heartwood Color

An old cypressman interviewed related to me that the trees growing on the same site might have a variety of heartwood colorization (Sheets 2003). The color of heartwood has been researched and it has been theorized that specific site conditions are the determining factor that contribute to the development of different colors of heartwood (Bassemier 2004). Conventional wisdom of sinker harvesters is red heartwood is directly proportional too the resistance to decay from insect and microbial attack. Sinker logs are found either on stream bottoms or more often sunken in the mud. One harvester would not even bother with raising a log that was not buried in at least three feet of mud (Sheets 2003). His theory was that cypress lying on the bottom had a tendency to absorb flowing sediments and this attributed to discoloration of the logs. Further, he
postulated that logs found buried in the mud were under anaerobic conditions that preserved the heartwood in a better condition for uses in wood working applications.

Conclusion

One may ask the question why is a significant portion of this chapter focused on cypressene and grades, and less on the other characteristics of cypress. The biogeography and ecology has been discussed in such great detail in many other cypress studies and I feel very strongly that as its relates to sinker cypress, not all of these characteristics were pertinent to this chapter. The subjects of nomenclature, grading and cypressene are critical to understanding sinker cypress from a biological perspective and its application in commercial enterprise. The confusion of nomenclature has bothered me for several years and I felt this was the place to I should attempt to clarify much of the debacle of “what cypress is where?.” Cypressene and grading are key issues in determining why sinker cypress is found on the lumber market. The resistance to decay of sinkers and the possibility of finding a high-grade log provides a large motivation to recover these timbers.
Chapter 3

The Lost Landscape of Louisiana

“…That where something happened in the past deserves, indeed requires, interpretive consideration; that when it happened was conditioned by ecological (innovation) and locational (logistic spatial diffusion) considerations; and that how and why it happened depended very often upon the kinds of crops or staples that were tended in that place or region” (Earle 1992: 23).

Introduction

The same could be said for extractive commodities such as the baldcypress. I grew up in a cypress boomtown. A professor of mine once remarked “the landscape never lies” (Davidson 2002), and this was never more true to me than the in the rural swamps adjacent to my home. This position, on the truth a landscape purveys is in this case specifically to rural landscapes as opposed to controlled landscapes (See appendix K). As children, my friends and I would spend our days in the swamps, exploring the bayous in a Humboldtian manner, feeling as if we were the first to ever lay eyes on its wonders and beauty. Always in the back of our minds was the feeling that something was amiss. There were great stumps of old cypress trees standing hollow, which on a cold morning of squirrel hunting could provide shelter from the wind and a place to build a small fire. These had once been big trees, and the stumps were sometimes four to six feet across. The stumps standing in the swamps were out of place among the younger cypress trees. Unnatural bayous that were straight as an arrow with small levees built along side of them often left the impression that we were not the first to be here. What we were seeing in the great hollow stumps was the remnants of a lost landscape. We were witness to the changes to that landscape made by the pull-boat canals and levees. The levee our campsite was built on was manmade, even though as kids were aware that this was not natural. Little did we know that in a flat swamp there are not supposed to be many straight lines of ten foot high earth, especially on only one side of the river. This unnatural landscape was all that was left of a bygone era, but
unbeknownst to us; there were still others markers of the past, logs whose value is ever increasing resting silently on the river bottoms waiting to be discovered.

The words of Carville Earle characterize the historical actions made throughout the swamp. The where are the bayous, swamps and lakes of Louisiana. The innovation he spoke of is the invention of the pull-boat, narrow-gauge rail, and overhead skidding systems. The spatial diffusion is how these new innovations made their way into every marketable stand of baldcypress. The how and why the swamps are had been made available to the public after congressional deliberation and the repeal of the Southern Homestead Act and the creation of the Timber Act. This chapter will address the historical significance of cypress lumbering in Louisiana, and how the history of cypress lumbering affects and contributes to the recovery of sinker cypress.

The history of cypress forestry in Louisiana can be divided into three time periods. The first is the pre-industrial period (before 1890), the second is the industrial period or “cypress boom” (1890-1925) and the last is the post-industrial period (1925-present). By using historical data, we can follow a trend in harvest production, and track how cypress found its way across the country and more importantly how many of these merchantable timbers were lost in transit.

**Pre-Industrial Period**

The Seminoles called cypress *hatch-in-e-haw* (Buchart 2001, Mancil 1972) and the French colonist called it *cyprieres* (Norgrass, 1947), but most people in Louisiana refer to the tree as cypress. Pre-industrial harvest began in 1708 as the French settlement in Louisiana expanded and utilized the wood for construction in the fledgling town of New Orleans (Mancil 1972). Bienville officially established New Orleans as a colony in 1718 (Pedro and Mena 2000) and the peripheral region around the colony contained an abundance of cypress (Colten 2003). After a short period of development and acclimation to the new environment, the settlers discovered that
Cypress was resistant to decay and the softness of the wood made it easy to work with (Mancil 1972). The colonists used the large cypress trunks to modify the Native American canoe design (Sauer 1980) to create a pirogue, a local variation, capable of carrying up to thirty people and large freight payloads (Norgrass 1947). Early methods of timber removal, inefficient by today’s standards, used slave labor and draft animals to pull the giant felled trees through the swamp (Colten 2003). Girdling, an innovation used in the slash/mulch system (Thurston 1997) to render a tree lifeless, was adapted by French settlers to harvest cypress because the technique greatly increased the possibility of floating a log during the spring floods (Williams 1990). Girdling is the process of hewing a ring around the base of the tree, separating the bark and sap ridge. The result is the prevention of sap flow from the roots to the rest of the tree. Over a period of time, preferably for at least six months, the trees would become less moist and more buoyant, thus allowing floatation to be used as the primary mode of timber transport to the mills (Sheets 2003).

In 1723 the newly formed Council of New Orleans began to issue directives to begin cypress harvest for trade and production (Mancil 1972). Cypress as a marketable trade began in the late 1730s when cypress timber harvested in Louisiana was sent to the French West Indies (Mancil 1972). When the Spanish gained control over Louisiana in 1763, there were already several mills operating in the New Orleans area (Colten 2003). During the early years of Spanish leadership the timber industry in Louisiana slowed, but eventually gained momentum again by 1800 (Colten 2003). The Spanish then began to trade from Louisiana to Spanish and French ports in the West Indies for use in the creation sugar crates (Mancil 1972).

When the Americans took control of Louisiana, there was a significant increase in cypress production in the state (Mancil 1972). The United State gained ownership of Louisiana in 1803 from the French, who had only weeks before reclaimed ownership from the Spaniards (Beers 1989). According to Ervin Mancil’s doctorial study of cypress history, the steam mill, circular
saw and a band saw mill had been developed and subsequently used for timber production in Louisiana during the 1800s (Mancil 1972). As great a technological innovation as these mills and saws were, the sawmill production capabilities would pale in comparison to the industrial engineering developments (pullboat skidding, overhead cable systems and narrow gauge rail) that begat the industrial harvest of cypress in Louisiana from 1890-1925.

**Cypress and the Expansion of the United States**

Because of their inaccessibility, the great stands of cypress were relatively safe from harvest (Prophit 1982). Three combined major factors led to the beginnings of industrial harvest: the depletion of timber reserves in the north, land use legislation, and the advent of the steam skidder (Norgrass 1947). The steam skidder or pull boat as it is sometimes called made it possible to harvest the untouched stands efficiently and profitably. For most of the 1800’s the story of cypress remained the same. The trees were girdled in the fall and when the June floods arrived the timbers were felled and transported to the mill via rafts poled by hand (Moore 1967) or on a much smaller scale pulled by draft animals. This method of log felling and removal transport primarily remained unchanged until the 1889 when the Baptist pull-boat and the Butter’s overhead cable system techniques were instituted (Williams 1990).

**Congressional Legislation**

In the Congressional Act of 1849, Congress gave the state of Louisiana all of the swamp and over flowed lands within the state boundaries (Norgrass 1947). It totaled 10,210,122.58 acres and the state received an additional 549,339.13 acres in 1850 (Norgrass 1947). Rachel Edna Norgrass wrote that the 1849 Congressional Act was the, “...prologue to the swelling, imperial theme; the intrusion of the woodsmen ever ready to hew these monarchs of the swamp-lands into a mighty industry-Cypress” (Norgrass 1947: 11). From approximately 1854-1860, there had
Figure 10: Girdled Cypress Stump  Orange, Texas.
been a concern within the state of timber removal on state lands by outside interests, who did not yet own the land nor have timber rights (Lillard 1948, Moore 1983, Williams 1990). The penalty for this criminal act was a $500 fine and/or one year of imprisonment (Norgrass 1947). The situation became dire enough to warrant arrests and apprehensions through the use of a gunboat on the Red River (Norgrass 1947). In 1855 the State placed 1,000,000 acres up for sale to the public (Norgrass 1947). Compared to the total amount of land for sale, few investors purchased swamp land and much of the land remained idle under state ownership. In 1862, Congress passed the Homestead Act, which allowed persons to file a claim for one hundred and eighty acres of land for $1.25 an acre (Norgrass 1947). The Act stipulated that the landowner must cultivate the land and reside on it. After the United States Civil War, the government passed the Southern Homestead Act of 1866, which granted African Americans and poor whites the opportunity to purchase state lands on which they could farm and begin a life (Williams 1990). A significant number of state lands in Louisiana at the time were swampland and incapable of being cultivated productively, but the Southern Homestead act did allow for the sale of these lands and restricted said purchases to a maximum of eighty acres (Williams 1990). There are accounts of “dummy” landowners who filed for claims on the land, harvested the timber and subsequently abandoned the land (Lillard 1948), leaving the claim to eventually fall back to state ownership (Williams 1990). In 1876, at the behest of eastern senators, particularly those from Vermont, Congress created the Timber Act (Norgrass 1947). Eastern senators had a strong opposition to the homesteading of land that contained large stands of timber (Norgrass 1947). The Southern Homestead Act was repealed in the same year at the request of southern states who felt that the lands and the vast amount of timber on those lands would be better suited to developing an industrial society in the South (Norgrass 1947). The outcome of the Timber Act was that all timberlands must be sold at public auctions and not all lands sold were to be used for
homesteading purposes (Williams 1990). Many lands were sold for a mere twenty-five cents an
acre to Northern investors (Castay 1998). Louisiana state lands created from the Timber Act
resulted in an astonishing 3,181,614.41 acres sold at auction (Norgrass 1947). “Thus, the South
during Reconstruction was a classic case of an underdeveloped region where the first industries
to be developed were extractive and exploitive” (Williams 1990: 239).

Of all the lands sold in Louisiana, 83.9 percent of the purchases of 5,000 acres and greater
were bought by Northern investors and then sold or leased to lumber companies (Williams
1990). The northern investors were, in some cases, persons who had gained lumbering
experience mining timber in the now depleted Great Lakes region or were those persons who
could recognize a good financial opportunity (Lillard 1948). Pine trees are relatively easy to
harvest in Louisiana compared to cypress. After the bust in the Great Lakes region, a large
number of Northern investors focused their attention on the southern pine lumber industry, while
other investors purchased vast amounts of the prime cypress timber lands. It was estimated that
there was an average of 6,000 board feet of cypress timber per acre (Williams 1990). The
resulting investment in the merchantable timber was a price of five to ten cents per thousand
board feet and a subsequent selling of each thousand board feet for a market price of five to ten
dollars (Williams 1990). The trees were still safe from large-scale harvest operations for several
years, but that changed with the advent of the pull boat system in 1889 (Williams 1990). In
1886, Horace Butters of Ludington, Michigan invented the steam skidder and later that year the
overhead or cableway skidder was developed (Mancil 1972). A New Orleans man named
William Baptist created the pull boat system proper and it was then that the cypress boom began
(Williams 1990).
The Cypress Boom

From 1890 to 1925, old growth or virgin cypress had been harvested in a fashion some would call strip mining. An early estimate of standing cypress timber in the South was forty billion board feet (Mattoon 1915). The 20th century saw large-scale changes throughout Louisiana’s landscape; chief among these changes was the harvest of the great cypress stands and the development of mill towns in the areas adjacent to them. Numerous mill towns sprouted along the bayous and rivers of Louisiana. Some pre-existing towns, like Springfield and St. James, grew from small settlements into full townships (Mancil 1972) while others, like Ruddock, Morley (Boudreaux 1967) and Strader developed from the need for close proximity of mills located deep in the swamp to the resources.

![Figure 11: Opdenweyer-Alcus lumber mill](Source: Kerney Sheets Collection)

The population increases during the timber rush in Louisiana were astounding. An example of a typical mill town is Springfield, Louisiana, located beyond the great cypress stands on the western side of Lake Maurepas. The Spanish settled Springfield over two hundred years ago. It is my geographic opinion that the location of Springfield was chosen because this is the first location along the Natalbany River located above the maximum flood regime situated on the Pleistocene terrace (that would be safe from flooding) that could yet still be accessible by water. Fred Kniffen wrote, “Waterways were the early routes of travel…the natural levees were the features sought out by Europeans primarily because they were well drained and because they were bounded by streams” (Kniffen 1990: 4). Springfield was a cypress boomtown, one of a few
population centers in existence before the boom (population 225 in 1895) (1895 US Atlas 2003) began in 1889 and after the last of the mills closed in the early 1950s (population 395 in 2000) (U.S. Census Bureau 2000). Mill towns were often located in close proximity to a navigable water channel that allowed swampers to transport felled logs to mill sites. By 1889 capitalism had now turned its gaze south towards the great cypress swamps of Louisiana. It was then the timber barons arrived and began conquer the “sentinels of the swamps” (Prophit 1983: 1).

Logging Methodology

At the peak of the golden age of industrial cypress logging there were approximately fifty-one cypress mill towns in operation and many of these towns contained more than one mill (Mancil 1972). Mattoon estimates that there were at least 94 active cypress mills operating in Louisiana alone during 1913 (Mattoon 1915). In 1908 the F.B. Williams Cypress Lumber Mill located at Patterson, Louisiana was the largest sawmill in the world, producing 150,000 board feet of lumber per day (Castay 1998).

Industrial cypress lumbering methodology was an evolutionary process that began with Butter’s technique of utilizing a single drum winch pull-boat and a system of overhead cables and ended with the Baptist method of implementing ground cables and a two-drum system on the pull-boat. Earlier techniques of moving logs to central locations were the arts of poling and wading (Fritchey 1994). Poling was the art of standing astride a log and using a pole to guide it out of the swamp. The wading method was a technique where a man would wade in the water pulling logs through the flooded swamp (Fritchey 1994). Overhead skidding (See appendix C) is the earlier method of log removal, but it had drawbacks, mainly the need to manually bring the cables back to a starting position near the fallen logs after the single winch had reeled the logs to the pull-boat (Norgrass 1947). The later Baptist method became the more prevalent means of
transporting felled trees (Norgrass 1947). It is a complicated process consisting of a pull-boat acting as the central towing station for an intricate cable system used to pull logs from the heart of the swamp towards the pull-boat. Runs or roads are canals dredged or dynamited in the swamp that allow the pull-boat to have an unimpeded route to the timber. The pull-boat was equipped with two winches, a primary pulling winch and a messenger return winch (Sheets 2003). A cable was attached to the primary winch, which would be extended to a maximum length of five thousand feet, at the end of this length the cable passed through a pulley and returned to the pull-boat. The returning side of the cable was attached to the messenger winch (Sheets 2003). On the primary or pulling side of the cable were attached four buckles spaced fifty feet apart (Mancil 1972). The buckles then had cables attached to them, which in turn had multiple cables connected furthest end (Mancil 1972). The ends of these extra cables were then bound to felled trees (Sheets 2003). The pulley was connected to a sheave block that was held in place by a binding to a “spar” tree or stump (Sheets 2003). A spar tree had to be large enough to maintain the sheave in a fixed position while the primary winch pulled logs along a run towards the pull-boat (Sheets 2003). Logs were always pulled at the farthest end of the run first (Williams 1990). The reason was the accumulation of excess soils along the log path, which would ultimately lead to a need of clearing and loss of productivity (Williams 1990). The problem of logs digging into the ground was resolved by “sniping” or chopping points on the ends of the logs (Mancil 1972). The logs were then towed to an intermediary slip for storage until the operation had accumulated enough logs to warrant the construction of a raft that could consist of up to one hundred logs lashed together. Most rafts were three to twenty logs wide (Castille 1993, Sheets 2003). Rafts were often cigar shaped and attained lengths as long as 200 feet long (Bryant 1923). Slips were often time natural bodies of water, but in some cases had to be dredged in order that they could be utilized more effectively as a holding area (Sheets 2003). Sinker
harvesters today frequently seek slips as a place to excavate sunken logs (Sheets 2005). Today one can fly over the great swamps and see the wagon wheel patterns of canals, created to harvest logs in the most effective means possible, still imprinted on the world serving as a reminder of lost landscape and for many a hidden past (Walker 1991).

Sinkers, or deadheads as they were often called, were frequently lost in storage areas as well as during rafting operations. Loss of logs or waste was a symptom of poor management techniques (Mattoon 1915). A major cause of log loss by sinking can be traced to poor workforce quality, coupled with the poor workforce supervision by work site operation managers (Mattoon 1915).

Figure 12: Areas of industrial cypress logging
Source: Mancil, 1972
When a tree is girdled correctly, the felled log has a 95 percent chance of floating; a tree that had been girdled incorrectly has only a 10 percent chance of floating after felling (Mattoon 1915). There are two schools of thought concerning girdling; the first is that trees should be girdled in the fall when the swamps are the driest, the second is that the trees should be girdled in the late spring and early summer months following the annual floods (Mattoon 1915). Both methods were used but it is unclear as to which method was more successful when comparing the number
of logs that arrived at the mill. Mattoon estimates in his 1915 report to the Department of Agriculture that there are possibly thousands of lost logs in the waterways of Louisiana (Mattoon 1915). Another method of removing cypress timber was the use of narrow-gauge rail (See appendix B).

Figure 14: Overhead image of Pass Manchac (Note wagon wheel shaped pull-boat runs)
Source: Louisiana Department of Natural Resources
Industrial Culture

Swampers. Life as a swamper was rough. Most were either former slaves or poor whites (Williams 1990). Many workers were those leaving the now cut over lands of the lake states (Comeaux 1972). A worker would often work in the swamps for a week at a time (Sheets 2003). Working conditions were, on the best days, hazardous and arduous. Swampers worked in the extreme heat and humidity of summer days and in the wet, cold Louisiana winters. Mosquitoes, alligators, and cottonmouth snakes (moccasins) thrive in the swamps. Workers would stand on the edge of pirogues, taking full axe swings at giant timber while their partners were performing the same task mere feet away. If a swamper was too slow, a falling tree could land on him and the possibility of drowning was far from remote. A swamper could have easily jumped onto the fallen tree and de-limb it without a missing a swing (Sheets 2003). After a long day of working from dusk till dawn, the swamper slept on a barge in a hammock or cot in a mosquito infested swamp with no fan or air conditioning (Sheets 2003). During the week meals were docked from the workers pay and any other needs were purchased through the company commissary and docked. Oftentimes when the workers, most who were single, did finally receive their pay, sometimes in the forms of borozeens (coined company money) they spend it on necessities at the company owned store in a company town at a considerable mark up (Ourso 2004, Sheets 2003, Williams 1990). Life was hard as a swamper. The centers of harvest were located around Lakes Maurepas and Ponchartrain, the lower Mississippi River alluvial valley, and smaller tracts in southwestern Louisiana and in Winn Parish (Mancil 1972). The Edenbourne Cypress Brake in Winn Parish was a stand of timber that was considered at the time, the late 1890s, the largest and oldest stand of cypress in the United States (Norgrass 1947). Three of the largest trees were reportedly left as monuments after the site were harvested (Norgrass 1947).
Figure 15: Locations of cypress mill towns
Source: Based on data provided from Mancil, 1972
Figure 16: Geographical and commercial distribution of cypress in the United States
Source: Mattoon, 1915
By 1912 the 1,000-acre Edenbourne Cypress Brake had been completely depleted with the exception of the three monuments (Norgrass 1947). In 1917 peak production of cypress lumber was more than four billion feet (Norgrass 1947).

The Post-Industrial Period

The postindustrial period was one of decline. As stands of cypress were exhausted, the boomtowns disappeared from the landscape as fast as they had appeared. The golden age of cypress lasted from approximately 1905 to 1935. During the late 1920s and 1930s cypress timber became scarce. Logs that had once been considered low grade and left lying on the ground were now being salvaged for lumber production (Devall, Van Deusen and Reams no date). Nothing was left to waste. Towns like Donner, Strader, Morley, and Ruddock that had sprung up in the swamps around these mill sites disappeared into oblivion after the timber ran out (Boudreaux 1967). Only a few aged pilings leave their mark on the landscape (Mancil 1972). The big cypress was gone, no longer on the landscape would one see great rafts of logs floating down the river (Wackerman 1947). Mills would close and the depleted timberlands were sold as the industry changed from a “get in, cut it and get out” mentality to one of management to renew a valuable and scarce resource. The focus of forestry shifted from cypress to pine, which was far easier to manage and harvest. Some towns such as Springfield, established before the boom, returned to their original population sizes.

Kerney’s Story

To understand history, it is often beneficial to include a humanistic perspective by including the narrative of an actual participant. Fortunately during the course of my research I was provided (via a former forestry professor) an opportunity to meet with a descendent of a cypressman who had also been involved with the harvest of standing and sunken cypress himself. This man’s name was Kerney Sheets and the next portion of this historical chapter will
be a recollection of his experiences and his fathers’ before him and how their experiences relate to the study of sinker cypress.

Kerney’s father, Jacob, worked as a foreman at the Opdenweyer-Alcus lumberyard in Sorrento, Louisiana for over 60 years. Sorrento is located between Baton Rouge and New Orleans in the swamps adjacent to the south shores of Lake Maurepas. The town was an epicenter of logging activity in the heart of cypress operations within the state. Kerney was immersed in cypress culture and, at 76 years old, it is still part of his identity. Kerney relates the adverse conditions of the work, fortunate workers could ride the narrow-gauge rail daily to the
harvest site, and others had to spend the night on a barge. Accidents were a not an uncommon issue, and the nature of the work created an environment that some accidents were severe enough to prove fatal. Some of the trees on the over head cable systems contained thousands of board feet of timber which could easily crush an automobile, much less a man. These massive logs were stacked in a swampy habitat, whose unstable topography had been radically altered to either accommodate dredged canals or levees created to allow the creation of a swamp rail system. Kerney and I have spoken at great length of the timber barons and their legacy. Kerney once told me that they would buy two trees and take three. Kerney has a vivid memory of when his father’s employer, the owner of the mill, convinced his grandmother to sell one hundred and eighty two acres of high grade standing timber for one hundred and twenty nine dollars. The modus operand was “get in and get out.” The harvest of our cypress was more akin to mining rather than management. By the late 1930s and 40s cypress inventories were becoming scarce. In 1948, Kerney who had supplemented his income working at the refineries by building cypress boats, found himself with a dearth of material. Kerney broached the subject to his father who suggested that he should try raising sinkers. According to Kerney, people had been raising sinkers as long as the trees had been harvested. Under the guidance of his father and uncle, Kerney developed his skills. Kerney raised over 300 sinkers over the next sixteen years. The specifics and logistics involved with his and other harvester’s recovery methods will be detailed in later chapters.

**Historically Significant Legal Cases**

Bell Lumber versus Stout (134 La. 987, 64 So. 881)(1914); and Davis-Wood versus Canulette (164 La. 301, So. 855) (1927) are the two legal cases that set the legal precedence still followed today to determine ownership of sunken logs (Carter 2004). The following text is a summary of Bell vs. Stout and is as follows: a legal suit was filed from the plaintiff J.C. Stout against the
defendant J.A. Bell Lumber Company for stoppage of J.A. Bell Lumber Company from recovering sinker logs in the Calcasieu Parish streams claiming said sinkers belonged to the plaintiff. Ownership of the sinkers is determined by whether or not the logs were considered legally abandoned. Abandonment, under the laws of Louisiana, is defined as whether the owners of the logs are having made known intentions to raise the sinkers and if any action to raise them had been made to their recovery. Bell proved the logs were abandoned by providing evidence that J.C. Stout had made no attempts to recover sinkers and further that J.C. Stout had provided no means to show that the logs were ever their legal property prior to loss. Logs were often branded with a company mark to distinguish one company’s ownership over another. The brands claiming to have belonging to Stout’s company were found on numerous logs, but the court could not determine whether the logs recovered were still their property because the logs could have sunk after the mill purchased them from the company. As a side note, the mill that received sinker logs was not liable to the owners, whether they were the raisers of logs or not, and are not liable financially to the owners for receiving said product. It was established that the burden of proof of ownership lay with the owners, but the finder of the sinkers must try to contact the owner to gain permission of the owners to claim the logs.

Davis-Wood Lumber Company vs. Canulette Shipbuilding was a similar case. The Lumber Company had already established a mill on Bayou Lacombe and the Canulette Shipbuilding Company began to raise sinker on Bayou Lacombe. Davis-Wood established that all of the sinkers logs in Bayou Lacombe had only been in the streams in past six years. All the mills in the area had maintained an effort to recover all logs lost and to return any recovered logs to their rightful owner. After years of effort the mills recovered most, if not all, logs lost during transit. Davis-Wood proved that it had owned timber rights adjacent to the stream and no logs other than their own had been transported by the stream other than theirs. This proof established
their ownership of sinkers and their clear intent and action taking to recover their claim that said logs were their property and Canulette shipbuilding had no claim over the logs as they were not considered abandoned by Louisiana law. These two cases clearly establish the legal concerns of ownership that sinker harvesters have to face today. Although both cases are over seventy years old they still provide the basis of legality when determining of ownership of sinkers. Since most of these businesses are now defunct, determining ownership of the logs is considered a futile effort and there has been little or no effort by any of the remaining timber companies to raise sinkers in the state.

**Concluding Thoughts**

Industrial cypress lumbering in south Louisiana created changes to the landscape. In 1943, only forty two billion board feet of timber was left standing in the state and of that, only a little over 3 percent was cypress (Winters, Ward and Eldredge 1943). From 1890 to 1909 an annual average of six hundred and thirty million board feet of cypress had been felled (Norgrass 1947). From 1909 to 1925 production averages increased to an astonishing three and a half billion board feet cut annually (Norgrass 1947). The end of the boom being marked by an extreme reduction in harvest of only two hundred and ninety six million board feet (Norgrass 1947).

I often hear people say that they wish the loggers would have left a couple of trees standing. If one looks hard enough and takes the time to read the landscape, old timber can be found. They are still standing there, along the riverbank or atop an old rotted stump in the swamp. The experienced and studied sinker harvester can find lost deadhead logs, just by taking the time to stop and listen to what the landscape is saying. They follow the old runs, seeking out where the logs may have been lost and if successful they can make a few dollars.
Figure 18: Kerney Sheets hand winching a sinker circa 1950
Figure 19: Kerney Sheets raising a sinker
Figure 20: Sinker log (note the sawed end)
Figure 21: Old growth cypress tree, Rome Ferry Bridge (Notice self-pruning, limbs only at the top of the tree)
Figure 22: Lone old growth cypress tree
Figure 23: Old growth cypress standing among second growth cypress
Chapter 4

Governmental Regulation and Operating Principles of Sinker Cypress Recovery

The recovery of sinker cypress in Louisiana is not as simple a process as finding the hidden logs and raising them, there are important environmental concerns that have to be taken into consideration. The world we live in now has a deep appreciation of nature and has taken (in most cases) a more responsible attitude towards natural resources and their uses. Sinker cypress recovery in Louisiana is no exception. Louisiana has taken great strides to this end and has enacted, along with the federal government, laws to protect our environment.

Ownership

The first consideration in the process of recovering sinker logs is whom do they belong to? Most sinker logs are classified as abandoned. Article 3418 of the Louisiana Civil Code states “One who takes possession of an abandoned thing with the intent to own it acquires ownership by occupancy. A thing is abandoned when its owner relinquishes possession with the intent to give up ownership” (La. C.C. Art. 3418 1983). For practical purposes the cypress industry as it applies to industrial logging ended in the mid to late 1950s. By that time most, if not all, of the cypress lumbering companies had concluded their business in Louisiana and terminated all operations. By that account, the logs left lying at the bottom of Louisiana’s waterways were left in the public domain and the timber companies had taken no action to recovery the logs. Article 3418, Note 4 also states, “One who takes up lost or stranded logs does not become the owner thereof, unless the former owner has relinquished or abandoned such logs. Person who desired to sell the sunken logs in stream should contact owner and obtain authority to raise logs.” Taking this note into consideration, the recoverer should make an attempt to contact the owner. The problem is that most if not all of the companies are now defunct. The logs could have been lost by any number of companies over a period of at least thirty years resulting in difficulty
determining which company originally owned the logs using Louisiana’s waterways for product transportation. Article 3422 of the 1870 Code further states the finder should “do all that is possible to find out the true owner” and “For although the owners of such things lose the possession of them, yet they retain the ownership and the right to recover them.” Finding the owner is often a futile effort. Another Article of the Louisiana Civil Code 3419, Notes 4 states “Person who desired to sell sunken logs in stream should contact the owner and obtain authority to raise the logs.” The title of this study is treasures of a lost landscape and due to its inherent monetary value sinker logs may also be considered treasure. Article 3420: “A treasure is a movable hidden in another thing, movable or immovable, for such a long time the owner cannot be determined.” If sinker logs are defined legally as treasure then there is no reason for the raiser to obtain permission.

For years sinker cypress was considered to be the property of the state, but after further investigation by the Louisiana Office of States Lands the following law was found: Louisiana R.S. 41:1001 note 2, “Abandoned or derelict logs do not become property of the State of Louisiana, even though they rest upon the beds of navigable streams, and therefore state could not, in absence of statutory authority, grant to any party or parties, by means of contract, right to raise and recover sunken logs in navigable streams.” Prior to gaining this knowledge, many harvesters were under the impression that the logs had to go through a public bidding process to obtain ownership. Because of this, many harvesters raised the logs and did not inform the state of their actions.

The two case studies summarized in Chapter 2, J.A. Bell Lumber Co. versus Stout (C.C.134 La. 987, 64 So. 881) and Davis-Wood Lumber Company versus Canulette Shipbuilding Company,(C.C.164 La. 301, So. 855) set the legal precedence to determine ownership of abandoned logs in Louisiana waterways. J.C. Stout had made no attempts to recover lost logs,
which rendered the logs legally abandoned under Louisiana law. Davis-Wood Lumber Company
had proven that the logs lost in Bayou Lacombe were their property and had made active
attempts to recover the logs, hence the logs were not considered legally abandoned and Canulette
Shipbuilding had no legal right to raise them. These two court decisions, provided by the
Louisiana State Lands Office, are the fundamental basis that allows sinker pullers today to pull
and sell lumber from sinker cypress harvest (Carter 2004).

In the early to mid 1900s the laws mentioned earlier had regulated the rules governing cypress
recovery. As resources dwindle often there is a shift from common law to specific administrative
policies, which are enacted to protect the resource, an example being groundwater use in the
Plain states (Emil and Brooks 1988). The following sections will address the administrative
policies and rules that are designed to maintain water quality that directly affect sinker cypress
recovery operations.

State and Federal Regulation

The Louisiana Department of Agriculture and Forestry has little or no regulations as it relates
directly to the harvesting of sinker cypress logs. The department’s primary concern with a sinker
recovery operation is the disposal of mill residue (Buchart 2005). Mill residue are by-products
from lumber manufacturing procedures. Most persons who raise sinkers are small
private/commercial entities that may raise only a few logs per year. Their operations are usually
discrete enough that the amount of residue created, usually in the form of sawdust, is negligible.
A larger mill, with the resources to mill large quantities of commercial lumber, should already
adhere to a set of Best Management Practices (BMP, see appendix A) if the mill owners were
using sinker logs as a source of lumber (Deagle 2005). BMP’s are management techniques that
were implemented by the state to protect the environment and reduce any water quality
degradation that may result from industrial operations (BMP Manual 1997).
The Louisiana Department of Environmental Quality’s (LDEQ) major concern, as it relates to sinker operations, is water quality (Killeen 2005). Although there is no formal permitting procedure, exclusive of Section 404 of the Clean Water Act (see appendix A), the department recommends that any person removing sunken cypress logs should obtain a letter of no objection, under the conditions that any operation will: 1) not reduce water quality (minimize turbidity) and/or create any obstructions that may change hydrology and 2) ensure all State and Federal required permits are approved and received before any removal is to begin (Levy 1996). Further, if the U.S. Army Corps of Engineers decides that the operation requires a Section 404 permit, the sinker harvesters should contact LDEQ for Water Quality Certification procedures and permitting (Levy 1996). If the operation is located on a waterway within the coastal boundaries set forth by the Louisiana Department of Natural Resources (LDNR).

The Louisiana Department of Natural Resources acts as a clearinghouse, meaning a person trying to obtain a permit for raising sinkers can acquire approval or disapproval from the United States Army Corps of Engineers, LDEQ, and LDNR, by going through only LDNR’s permitting process (Pittman 2005). The clearinghouse procedures apply only if recovery operations are to be conducted at locations defined as a coastal area. Water quality, or rather the minimization of turbidity created from log recovery, is the primary concern of LDNR (Pittman 2005). The length of time that is needed to approve a permit is proportional to the complexity that the operation requires. Each permit is addressed on a case-by-case basis and is specific to its geographic location. Each location may have cultural significance or logistical aspects that effect the operation of other departments within the state. The Louisiana Department of Culture, Recreation and Tourism and Louisiana Department of Transportation and Development may have objections or stipulations to sinker recovery operations at sites of interest to state projects. The Louisiana Department of Wildlife and Fisheries regulates boating safety and monitors any
operations along Louisiana’s Scenic River System. Safety is a large concern and LDWF enforcement agents may inspect an operation in order to determine whether any self-propelled watercraft used are compliant with Louisiana’s water safety mandates, but the department’s primary concern is to determine if the proper permits have been filed if the operation is being conducted on a Scenic River or Stream (Mayne 2005). Louisiana has over 2000 miles of scenic waterways and is one of the largest scenic river systems in the world (Cascio 2005). The Louisiana Natural and Scenic Rivers System is “…unique and diverse free-flowing river, streams, and bayous which should be preserved, protected, and enhanced for the present and future benefit of Louisiana citizens” (La. R.S. 56:1841 West 2004). Title 76 of the LDWF 1988
Rules and Regulations defines the mandates and procedures the Louisiana Legislature outlined in La. R.S.56: 1841, including the permitting process that may allow, under certain circumstances persons to remove sunken cypress logs on waterway otherwise off limits to commercial activities. Cypress is almost ubiquitous to the waterways of south Louisiana and several Scenic Streams and Rivers are located there.

Each permit is handled on a case-by-case basis. A rule of thumb to follow is if a program is environmentally destructive enough to require a permit, then chances are limited that the applicant will receive permission to operate on a scenic waterway (Cascio 2005). At that point the correct course of action is to modify the proposal and operation to reduce and/or minimize habitat changes. Although not naturally occurring, the role of sunken logs in underwater landscapes may have become vital to the survival of certain aquatic species. All proposals must have a clear, well-developed plan, before any considerations will be made by the LDWF. All logs that are to be removed must be located in the waterway and listed in the proposal. The LDWF will not authorize a “fishing expedition” for sunken logs. Next, the LDWF must contact any other state agencies, particularly the Louisiana Department of Culture, Recreation and Tourism and the Louisiana Department of Transportation and Development, to ensure that any operation does not conflict with any mandates, proposals and policies set forth by said department.

Clearing and snagging is defined by the state as “the practice of removing most obstructions, trees, snags and other impediments that retard the natural stream flow” (115 of LDWF Title 76 1988). Under Section 115 of LDWF Title 76, the practice is prohibited. This may or may not include specific sunken cypress logs, which is why each proposal is reviewed individually. The proposal requirements are similar to those required by the U.S. Army Corps. of Engineers and LDNR: personal information of the applicants, location of operation, background and specifics
of operation, maps and images of operation sites and steps to minimize any environmental damage resulting from operation (LDWF Title 76: Section 117.C 1988). These are the requirements of LDWF as they pertain to sinker recovery, but are not limited to those mentioned in the prior statement.

**United States Army Corps of Engineers**

Fill or dredge materials are those sediments that are disturbed as a result of pulling sinkers out of the mud or off the bottom of a river or stream. This foreign impact condition raises the level of turbidity and may create a mud plume flowing downriver. The increased turbidity can have extreme negative ecological impacts on critical habitat. The whole purpose of requiring permits to operate on the Louisiana Scenic Rivers System, is to reduce the anthropogenic effects of the modern world on Louisiana’s protected waterways. The United States Army Corps of Engineers
regulates “the protection and utilization of water resources” (USACE 2005). “Section 404 of the Clean Water Act (33 U.S.C. 1344) Section 301 of this Act prohibits the discharge of dredged or fill material into waters of the United States without a permit from the Corps of Engineers (USACE, 2005).” Waters of the United States include, but are not limited to all tributaries and wetlands adjacent to Navigable Waters of the United States (USACE 2005). These require permits under Section 404 of the Clean Water Act if dredge or fill is discharged during log recovery (USACE 2005). The Corps of Engineers is the uppermost tier of water regulation and enforcement as it pertains to any activity that may degrade the environment. The U.S. Army Corps of Engineers must approve any harvesting of sinker cypress logs in a navigable waterway for the activity to be legal.

The permitting process averages two to three months of review before a determination of approval or disapproval is made. Applicants must submit ENG Form 4345 and supporting information (drawings, maps, relevant material) to their district regulatory office. Most of south Louisiana falls under the jurisdiction of the New Orleans District office. The process moves is multi-tiered: “first the application is received and given an identification number, second a public notice is issued, third a thirty day comment period, fourth the proposal is reviewed by the public and all governmental agencies (state and federal) who may be affected by the operation, fifth the Corps considers all comments, sixth the Corps may request additional comments again, seventh a public hearing is held (if needed) and lastly the District Engineer makes a decision and the permit is issued or denied” (USACE 2005).

The United States Coast Guard’s primary concern, as it relates to sinker cypress harvesting operations, is safety (Ramos 2005, Turok 2005). Is the operation of the barges inhibiting safety and will the transport of salvaged logs endanger other watercraft?
Local parish sheriff’s departments, though not usually considered part of the permitting process, can play an important role in preventing sinker recovery. Many parishes that include navigable waterways within the parish boundaries maintain a division within the sheriff’s department that monitors and enforces, alongside the Coast Guard and LDWF, Louisiana’s boating laws and regulations. Each parish may have their own individual laws regarding waterway operations, but most sheriffs’ deputies interviewed maintain they follow the rules and regulations set forth by the state and federal government (Boudreaux 2005, Poche 2005).

Figure 26: United States Army Corps of Engineers, New Orleans District
Source: U.S. Army Corps of Engineers
Tools of the Trade

The barge. Aside from skill and wisdom, the most important tool of a sinker cypress puller is the barge. The barge is the heart of the recovery operation. Barge design varies from one operation to another, but the overall design consists of a means of flotation, a deck and a winch/boom system. Most barges maintain buoyancy through the use of pontoons that may be constructed of metal or Styrofoam. An average sinker barge is often eight to ten feet across and may be as long as twenty feet.

Initial construction costs may be a twenty thousand dollar investment in a large-scale pontoon and heavy winch operation (Bassemier 2004), or small by using two large sections of Styrofoam and a wooden deck (Lobell 2005). Pontoons are often factory engineered, but can be created by welding fifty-five gallon drums together end to end (Sheets 2003). According to Kerney Sheets
each drum can support four hundred and fifty-five pounds of weight. Although unorthodox, some sinker harvesters use a skiff and an outboard motor or even an airboat to pull cypress (Lobell 2005, Broussard 2005). Larger operations tend to invest more in their rig, which allows for more efficient recovery practices. Some parishes mandate that any barge operating in Louisiana waters must have a means of waste disposal (Bassemier 2004).

The winch is the core of the barge. In early years some sinker raisers used a hand winch to raise logs. This is a long and tedious process and may take several days of winching and patiently waiting for a sunken log to break suction from the mud. Modern designs incorporate motor driven winches that can raise a log in a matter of minutes. When pulling sinkers, log suction can create such a force opposing the energy of the winch that it can pull the barge towards the log. The positive buoyancy of the pontoons in conjunction with the winch eventually pulls the log and forces the suction to break allowing the log to surface.

The operation of the barge is costly. One informant cites that it cost him an average of one hundred dollars a day to operate his barge and recalled expending fourteen hundred dollars in a twelve-day excursion (Decareaux 2005). His logic was simple, “you can sit at home and make nothing or you can roll the dice and go out and try to find some logs”. The largest source of overhead cost is fuel. Although rare, one harvester, who used his recovered lumber for personal use, maintained a pile driving operation and was able to minimize investing in sinker pulling operations by using equipment from his “day” job (Lobell 2005).

Time is another important factor. Most sinker pullers have “regular” jobs, and pull sinkers either to provide a source of lumber for personal use or as a means of supplementing income. Sinker harvesters have to plan ahead and coordinate moving their barges in a short time frame that would allow them to pull logs and maintain their regular jobs. By design, barges are not easy to transport from site to site. In the 1950s a puller could leave his barge at a recovery location
and commute in his free time back and forth in a lightweight, relatively fast boat. Waterway traffic is more common today and most pullers do not feel comfortable leaving a large investment unattended.

**Operations**

Finding Logs. Finding logs takes skill and nerve. It is a two-part process: first is to find a location along a waterway where the logs may have snagged and sank, and second to locate the exact spot where the log is (most pullers are hesitant to reveal how they locate an area). Two methods are used to locate logs. One method is to use a pole to penetrate the mud and sound for logs and the other is to dive and feel manually in the mud for logs (Lobell 2005, Sheets 2003). Locating the logs are is where reading the landscape and, more importantly, understanding the landscape becomes a tool. Many pullers know where the pull-boat runs were and from there they can surmise where the logs would have sunk. Logs would snag in sharp river turns and deeper regions adjacent to runs where logs were stored and sank before they were bound into rafts (Sheets 2003).

After the suspect area is determined, the modern method is to don diving gear and plunge into the depths. These are dark, cold, murky environments. Visibility is usually only inches in front of your eyes (Lobell 2005). The next step is to move along the bottom, attempting to maintain an awareness of trotlines and reach into the mud, often at arms length, to feel for logs (Bassemier 2004). Often divers will see catfish and feel other fish bumping into them while they are underwater (Lobell 2005). Water depths can range from relatively shallow to thirty to forty feet deep (Albert 2005).

Once the log has been located, the area adjacent to the log has to be cleared of mud, usually by hand or high-pressure water jet (Reese 2005, Sheets 2003). The purpose is to create enough space around the log to attach a cable or chain. The cables are attached to a winching system
mounted on the barge. As mentioned previously, breaking the suction between the log and the mud is a critical point of the operation (Sheets 2003). In earlier years Kerney Sheets used a hand winch, and the process of breaking suction would take as long as several days. Today’s modern mechanical winches can pull the logs in a matter of minutes. After the logs have been raised and fastened to the barge the process of moving the logs begins. Although a highly debatable topic, one source informed some logs could float as long as two weeks before settling to the bottom again (Broussard 2005). Because the logs do not trail evenly behind the watercraft it is important to place the logs forward of the engine (Broussard 2005).
Log storage is critical. Once a log has been moved to a permanent site, the log has to be either milled or stored. If the log is not cut within ten days of harvest, then there is a risk of checking and staining (see appendix A) (Cayford 1964). A check or end check is a split in the log end from differential drying rates between the center and outer sides of the logs (Cayford 1964, Decareaux, 2004). Staining occurs when the “sap” sours during the summer months and decolorizes the wood (Cayford 1964). Once the logs have arrived at the mill site, often at the home of the pullers themselves, they have to be moved from the water to the shore. Sinker logs are heavy and a tractor or forklift (or other heavy equipment) is needed to pull them ashore.
(Sheets 2003, Decareaux 2004). Though the cost of owning a mill can be expensive, most harvesters own their own mill. A local business is installing a mill onsite that would allow them to buy logs and mill lumber to specifications as the market demands (Forniea 2005).

Figure 30: Cypress tongs
Figure 31: Raised sinkers
Source: Kerney Sheets Collection
Figure 32: Raising a sinker

Figure 33: Cutting sinkers into small enough size to mill
Marketing Logs

Sinker cypress logs can be marketed either customer direct or by selling lumber wholesale to a commercial retail outlet. Cost may vary from one source to another. Production costs include: storage, mill, transport and drying. Drying cost includes moneys invested in inventory that is not marketable until the wood is sufficiently dry. Retail prices of lumber sold wet are approximately three dollars per board foot. Cypress pullers preferring to sell directly to retail customers earn an average of one to four dollars per board foot (Guy 2003, Decareaux 2004). High-grade quality sinker cypress lumber can sell for as high as eight dollars per board feet (Guy 2003). According to several sales managers who are employed by retail and distributor businesses, the popular market colors are green and black sinker cypress lumber (Forniea 2005, Russell 2005). Wholesalers who purchase sinker cypress often have a significant investment in drying kilns and the price of lumber has to be factored into cost (McAdams 2004). Commercial retail prices average two to five dollars per board feet (Forniea 2005, McAdams 2004, Russell 2005).

Florida is a more stable source of sinker cypress than Louisiana, both in availability and colors (Doolittle 2005, Russell 2005). Sinker cypress as a source of lumber is becoming scarce in Louisiana; in the recent years the market for sinkers has increased two hundred percent (Forniea 2005). The market for sinker cypress is primarily south Louisiana, but cypress is frequently sold for construction across the United States for restoration projects (Russell 1997) that use sinkers as matching lumber (Doolittle 2005, Broussard 2005).

For all practical purposes, old growth cypress is gone. Old growth harvest was primarily an “extractive” (Boyce 1974) endeavor rather than a renewable effort. Across the country, a large number of structures were constructed with cypress. Some restoration projects use sinker cypress to match the grain and texture of the old growth cypress found in the older structures (Broussard 2005).
Figure 34: Decorative sinker log
Figure 35: Milled sinker board
Chapter 5

Culture

Who pulls sinker cypress? Most of the pullers I have interviewed are “blue collar” workers who have made their way through life by working hard and learning from and building on conventional wisdom. Thus far, none of the cypress pullers interviewed have attended any formal college or university level training. Most are either self-made entrepreneurs or work (or have worked) at one of the many facilities based on the Mississippi River industrial corridor. These are people who realize that nothing in life is going to be easy, if they want it: they have to make sacrifices and will do what it takes to “make it” in life. The lifestyle of the sinker cypress harvester is not unlike the longshoremen of the city of Portland, Oregon studied by William Pilcher (1972). The longshoremen worked seasonally and oftentimes maintained self-employment during the off-season. Pilcher described the phenomenon using one’s personal skills to produce extra income, “There is a deep appeal in being in control of one’s own work regime and financial affairs, but its price is iron self-discipline and the willingness to face the possibilities of economic disasters (Pilcher 1972: 364-365).” Longshoremen’s income from secondary employment operate on small profit margins because they do not depend on it as a primary source of income which is similar in many respects to the sinker pulling operation (Pilcher 1972).

Structuration

Constraints and enablers are the fundamental basis of Anthony Giddens social theory of structuration. In simplest terms, structuration is the concept that structure (the rules we follow in life) is a dynamic force that constrains and at same time enables every action made by the human agent (us) (Gregory 2000). As opposed to structuralism where people are independent agents
acting within a fixed structure, the relationship in structuration is a dynamic, possibly
hermeneutical.

**Constraints and Enablers**

Constraints and enablers govern the actions of agents (sinker pullers) by allowing or
disallowing what the agent can or cannot do. In the case of sinker cypress pullers, constraints
present themselves in the form of governmental regulations, operating costs and the difficulty of
work. The “greener” position that society has taken does not tolerate ecologically unsound
practices. The result is the creation of policies and laws that constrain actions taken by
individuals when any work is being performed that may degrade the environment. The previous
chapter addressed the legal, financial and physical challenges a person must overcome to pull
sinker cypress. The possibilities of being fined and or serving jail time act as strong deterrents to
anyone who wants to pull sinker logs without the consent of the state and federal government.
Sinker recovery is a small, almost insignificant industry; but these constraints, in one instance,
prevented a large operation from developing in the Lake Maurepas and Lake Ponchartrain region
(Taylor 2005). Local activists became concerned with the negative impacts on the environment
and took steps to prevent the operation from starting (Taylor 2005).

Operating costs play an important role in constraining the efforts of a sinker harvester. The
cost involved in operating a rig or barge can be staggering. As stated previously one rig had an
approximate cost of twenty thousand dollars, not including the costs of diving equipment, a mill
to saw logs, storage, fuel and maintenance of equipment. Diving equipment has inherent cost, as
most people cannot afford the equipment to fill scuba tanks themselves. One has to include the
costs of refilling tanks, diving equipment (masks, gloves, fins) and fuel to deliver tanks to a
service location (Bassemier 2004, Decareaux 2004). Most businesses that buy wholesale sinker
cypress do not buy logs; instead they purchase lumber that has been milled to industry
specifications. A sawmill is a large investment. One interviewee stated his mill, a portable high-end computerized model, cost as much as a fully loaded luxury sedan (Decareaux 2004). Storage costs can be expensive, especially when one has to store large numbers of board feet of timber. Most people follow the one-inch per year rule, and that it takes, at a minimum, one year of air-drying for every inch (height) of lumber milled. It is not profitable to leave an investment in sinker cypress lumber in the elements. Building a storage shed can cost thousands of dollars.

![Figure 36: Portable lumber mill](image)

Fuel is as expensive today as it ever has been. Moving a large, heavy rig is fuel intensive. Knowledge of a log’s location does not ensure harvesting due to the high cost of moving the barge relative to the return on the investment. Economic soundness must be considered (Albert 2005). Equipment maintenance is cost that may be easily overlooked. An interviewee remarked
that he had to purchase a battery for his forklift (another large investment used to move his sinker cypress lumber) (Decareaux 2004). The incurred cost of the battery was enough that he mentioned of it during a conversation (Decareaux 2004).

Constraints play an important role in deterring persons from pulling sinkers. The operation is both cost and labor intensive and most pullers do not stay in the business long (Sheets 2003). Wholesale sinker cypress sells for approximately two dollars a board foot and direct retail sinker cypress averages about three to five dollars a board foot. An average log scales out (measures) to one thousand to fifteen hundred board feet. At one thousand board feet, each log is liberally estimated at two thousand dollars of wholesale cost. The owner of the operation must factor in the costs of operation ($100/day), log storage, milling costs, lumber storage (1”/year), and marketing (resulting in a small industry) (Decareaux 2005).
There are those who are reflexive and can succeed, albeit on a small scale, and make the business profitable. The people who succeed in profitable cypress harvesting are enabled by certain social factors: the economic benefit of pulling sinkers, proximity to sinkers and regionalization that allows persons to pass conventional wisdom from one agent to another. On a small sale, primarily as supplemental income, sinker cypress salvage can be a profitable endeavor. The key is to keep the cost low and not to depend on sinker cypress as a primary source of income (Sheets 2003).

The Mud Monster

“Crazy” Charlie Albert said, “The mud monster is a state of mind. It is raw fear. It’s the thought that you may never surface again, and they won’t ever find your body” (Payne 2000/1). Diving for sinker cypress can be one of the most terrifying experiences of a person’s life if they let their emotions run away with them. Imagine you are thirty to forty feet underwater in bayou, its pitch black, cold and you are using your hand to probe deep in the mud to feel for sinker cypress (Belanger 1987); remembering the alligators, snakes, sandsharks, gar, trot lines (see appendix A): this is when the mud monster can get you.

Fortunately, the opportunity to interview a man who sometimes spends a significant part of his normal workday underwater presented itself. He told me he knows there is nothing down there that is going to hurt him, he may feel a fish bump into him every now and then, but there is no real danger other than trot lines (Lobell 2005). He remarked that sometimes, if he stops and dwells on the darkness and let his imagination flow, he could really scare himself (Lobell 2005). I have the utmost respect for anyone who can face the world of the underwater environment. Fear of the mud monster is one of the leading reasons why people are hesitant to harvest sinker cypress (Albert 2005).
A cypress puller (Albert 2005) recalled two tales relevant to this thesis and the focus of the stories is the controlling of fear on the part of the diver. In the first story, the diver became entangled in two trotlines while diving. Again, imagine being thirty to sixty feet underwater, it is cold and pitch black, when he gazes up he cannot see the sunlight piercing the depths. Suddenly he becomes entangled in not one but two trotlines at the same time. Trotlines are usually small diameter, high strength lines that can hold a fish for at least a day. These lines do not snap when a diver pulls on them, instead they bite tighter into the diver's hands. The informant had two knives, one on his ankle and another on his chest and could barely reach the knife on his chest. Because he kept his cool he was able to slowly reach his knife, and, without dropping it, cut his way free. In the second instance, he was diving at a depth of sixty feet. Things were going well, and he encountered no trotlines. Suddenly he found himself with only two breaths of air in the tank. He had to make his way to the surface, remaining calm as not use up his remaining supply of air. The problem that at every thirty-three feet is equal to one atmosphere of pressure. His experience in diving had instilled the knowledge that you are not to ascend faster than his bubbles. He had to swim sixty feet with two breaths of air at a slow controlled pace. He kept his cool and safely returned to the surface.

A commercial diver who often dives for sinkers had another tale (Lobell 2005). He was diving in North Pass, a body of water that connects Lakes Ponchartrain and Maurepas. In the pass is a hole, known by the locals as the Hungarian Hole, which has an approximate depth of ninety feet. While diving he found himself touching the end of a rubber wading boot. The boot was full of something. Needless to say he found himself in an unsettling situation. He told me as he felt his way up he was hoping there wasn’t a femur sticking out the end. Luckily the boot was just full mud. Fear is an enormous constraint. Fear: fear of dark places, fear of the night, fear of cold at the bottoms of waterways. The desire to triumph over fear can drive people to accomplish
seemingly impossible tasks. While fear is a constraint, the resolve to overcome fear of the depths can be the greatest of enablers.

Poetics of the Swamp

Contestation of space: The rivers and bayous of Louisiana an ecologically protected landscape or an environmental source of profitable sinker cypress timber. I was at a deli where my frequent patronage has allowed me to develop a friendly relationship with the employees. One of the servers asked me what my graduate research was involving, to which I told him I’m conducting a geographical inquiry into the sinker cypress industry. His reply was that is a bad thing and people should leave those logs alone. His sentiments are not alone and there are those
persons who feel that any use of the rivers as source of cypress will result in negative impacts to the environment.

Conservation versus preservation, ecology versus economy, and culture versus nature: these three issues are the focal points of almost all environmental debates. Conservation is “…The efficient and non-wasteful use of natural resources…any form of environmental protection” (McManus 2000: 106). Preservation is “The saving of relict features in the human landscape” (Johnston 2000: 634). A professor of mine once remarked that ecology and economy are yin and yang to each other, two dynamic forces constantly at terms with one another struggling to find a balance in world. Tuan wrote, the “developer…nature is a resource to be used for substantial gain” (Tuan 1978: 28).

The preservation approach, in the form of the Scenic Rivers Act and Clean Water Act (which may be considered a conservation approach) seeks to protect critical habitats and our environment. People want to see nature protected and cherished. The pristine wilderness ideology, whether a myth or not, helps to develop a bond between nature and ourselves.

At the time of this writing, there is a legal debate whose purpose is to prevent the harvest of new growth cypress in the swamps as source of timber and mulch products (See appendix G) (Buchart 2005). People were outraged at the thought of another large-scale cypress removal project and legal action was quickly taken to prevent it from happening again. The issue became dire enough that then Governor Mike Foster held a conference with scientists and forestry professionals to determine if the arguments against harvesting operations were valid (Schleifstein and Grabell 2002, Dunne 2002). After state approval of cypress harvest, the Army Corps of Engineers invoked a century old harbors law that temporarily halted harvest operations. The issue is becoming more widely acknowledged and discussed throughout the state by academics.
and professionals alike. In 2003, Tulane University held a conference in New Orleans focusing on the ecological and environmental impacts of swamp logging in Louisiana.

As mentioned earlier, a potentially large sinker cypress removal project was “shut down” as result of public pressure and legal action (Taylor 2005). There are other small operations that feel differently, and see no problem with sinker cypress removal and continue in their endeavor to recover lost cypress logs. Many residents of Louisiana feel they have the right to use our waterways (Turok 2005). The conservation approach seems to find a middle ground between habitat protection and the ability to harvest sinkers.

Figure 39: Cutover cypress stand, Maurepas Swamp
People who pull sinkers cypress have to overcome permitting obstacles and the costs involved to develop a profitable operation. There are a number of people who are not informed of any environmental protection laws and continue to pull sinkers. Most are smaller operations and most use the timber for personal projects. With the exception of the Scenic Rivers Act, the harvest of sinker cypress is not a major concern of the state. Sinker cypress removal is a small industry, and unless that changes, it is unlikely the state will enact any regulations to prevent sinker harvesting operation specifically.

**End Products of Sinker Cypress**

People use sinker cypress for a variety of purposes. Most often it is used for interior adornment. The wood is aesthetically pleasing and is often used for trim and cabinet design. Crafters also use cypress for more non-typical purposes from creating a bar in the shape of a boat to coffee tables. Cypress is a soft wood and is a relatively easy medium to work with, hence the abundance of forms the end product may take. The imagination of the owner and the skill of the craft person are all that limits the shape cypress can take.
Figure 40: Bookshelf made from cypress

Figure 41: Dining table made from cypress
Figure 42: Ceiling made from cypress
Figure 43: Cabinets made from cypress
Figure 44: China cabinet made from cypress
Figure 45: Bar made from sinker cypress
Chapter 6

Conclusion

Why Pull? Pulling sinker cypress is hard work. The men and women who pull sinkers work under difficult circumstances and on limited budgets. Because a recovered sinker log can average in excess of one thousand board feet of lumber, and after milling, may sell for two to three thousand dollars. Many people do not sell their lumber, instead they use it to build their homes and create items limited only by their imagination.

History

The timber barons of the north fell on Louisiana and harvested the great stands of cypress timber. The landscape was altered, leaving marks that can still be found today. In the course of harvest operations, many of the logs sank and rested on the muddy bottoms of Louisiana waterways. Individuals and industry began pulling sinkers as early as the logs were lost during the industrial harvest era (Sheets 2003). In the early years of the turn of the twentieth century, the courts established legal precedence to determine the ownership of deadheads. It was deemed, with the exception of the Sabine River, that no active efforts were taken, the logs were considered abandoned. Burden of proof lay with the owner, but the persons raising sinkers were required to seek out the owner of the logs. Almost a century later the great timber companies of the past are gone. Records were lost and true ownership of the logs was lost. The logs were still there years later waiting for someone to recover them.

The latter half of the twentieth century saw a social awakening of environmental consciousness across the country. People began to question whether the practices of industry. Laws and policies were developed to protect our land. The people of Louisiana remember what they had lost and the state reacted accordingly. The Louisiana Scenic Rivers Act was enacted in 1988 and the state and federal governments created policies to protect and improve water quality.
Biology and Ecology

Cypress is highly prized because of the inherent durability and ease in which it can be used in construction. Cypressene is oil that accumulates in large quantities in older cypress trees. High concentrations of cypressene deter insect and microbial attacks. Younger cypress trees do not have sufficient concentrations of cypressene and are not as desirable as old growth cypress. The only sources today of old growth cypresses are those timbers salvaged from older buildings, hidden virgin stands and sinker cypress. Reclaimed cypress is cost intensive to recover (McAdams 2004). A clean board (nails and metal removed) can sell for $3-3.25 a board foot (Bradshaw 2003). Virgin stands are almost non-existent, and strict wetland laws provide a means to deter any actions taken to recover them. In 1974, there was only 1,147.5 million board foot of cypress standing in the state (Earles 1974) and that number had grown to only 1599.9 board feet by 1991 (Vissage, Miller and Hartsell 1992). There were 3,956,434,000 board feet cut in 1915 alone (Norgrass 1947). The only semi-reliable sources of old growth cypress are those logs that reside on the bottoms of bayous.

Finding and Extracting Logs

To pull cypress logs a person needs: knowledge of how to find logs, a means to recover the logs and a mill to convert logs into lumber. Every person who finds sinkers has his/her own method (Albert 2005) and most are reluctant to reveal their secrets. Both reading the landscape and understanding the methodology involved in transporting cypress during industrial harvest play a role in finding sinker. After the suspect location is determined, the preferred method is to use diving equipment and manually feel along the river bottom and hope that there is a log there. When the log is found a crane with a winch is used to pull the log to the surface.

The log is then fastened to a rig and after a quantity deemed sufficient by the operator is accumulated, the logs are transported to the mill location. Often, the mill is located near the
residence of the harvester. After the logs are milled into lumber, they must be dried. The standard rule for drying cypress is one inch per year. Commercial entities that purchase wet cypress lumber often have a dry kiln or dehumidifying room where the boards are dried more rapidly (as fast as two weeks) fashion. A problem with storing a log out of water is the outside dries at a faster rate then the interior and results in a “check”. A large check or split can significantly reduce the quality of post-milled lumber.

Cypress pullers either sell their wares directly to retail consumers or to wholesale customers. The owner of the operation must take into consideration the costs of fuel, barge construction, mill costs and operation, storage costs and general business costs. The sinker cypress industry is a small industry. Mattoon estimated that by 1915, thousands of logs had been lost in the waterways of Louisiana (Mattoon 1915). Thousands of logs have been harvested and there are some people who feel sinker cypress is a dead or dying industry because most of the logs have been already raised (Albert 2005).

Most if not all people who raise sinkers are either blue-collar workers or entrepreneurs. Their sinker enterprise is cost intensive and they may spend days searching for logs with little or no success. They dive into pitch black, cold water with their hands at arms length probing the mud for logs. They must contend with the real dangers of trotlines and just as importantly face the fears that arise from working in harsh conditions.

Legal Considerations

Before any work is done legally, the pullers must obtain permits from the United States Army Corps of Engineers. If the work is performed with the Louisiana coastal zone boundaries, then a permit must be obtained from the Louisiana Department of Natural Resources Office of Coastal Management. Further, if the logs are located on a Scenic River, as deemed by the state, a permit
must be obtained from the Scenic Rivers Coordination Office of the Louisiana Department of Wildlife and Fisheries.

The industry is small because there is only a small distinction between profitable and not profitable. Most people raise sinkers only as to supplement their established income. The process is cost intensive, tedious to get approval from the state and federal government, can be extremely scary and there is no assurance that you will find one log, much less several logs. Cypress is almost sacred to Louisiana residents. We treasure it because we accept it as part of our identity. At this moment there are federal cases involved in the prevention of younger cypress trees in the Lake Maurepas region being harvested in the swamps (Schleifstein and Grabell 2002, Buchart 2005). People feel very strongly that we should leave cypress and the swamps alone (Taylor 2005). People who pull sinker cypress have to maintain a balance between being profitable and being ecologically responsible. The saving grace of sinker cypress is, once again, because it is a small operation and is relatively insignificant when compared to the greater issue of coastal loss. Only when the operation become large industrial entities that people may become aware and take legal action to prevent pulling operations (Taylor 2005). It is becoming harder to find logs in Louisiana and the supply from Florida is far more reliable (Albert 2005, Forniea 2005 and Doolittle 2005).

**Geography and Sinker Cypress**

The author was asked, “What is the spatial component i.e. geographical component of your study of sinker cypress?” My response was Louisiana is a place where sinker cypress is recovered and the how many residents of Louisiana use cypress to identify them as part of a unique place and culture. Environmental geography has a strong focus on resource and hazard. Sinker cypress is a resource and supplies may be dwindling. The industry is small and as a result there are few laws enacted to specifically prevent the harvesting of sinker logs. However, there
are laws and policies that directly regulate water quality, and that in turn affects sinker recovery
operations. I not foresee the sinker cypress industry growing. After interviewing many persons
who pull or have pulled sinker cypress, the prominent attitude is that the industry will continue to
diminish as logs become harder to find.
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Appendix A: Glossary

1849 Congressional Act: Congress gave the state of Louisiana all of the swamp and overflowed lands within the state boundaries (Norgrass 1947).

BMP: (Best Management Practices); “Recommended operational guidelines to minimize environmental impacts and maintain water quality” (BMP 1997: 3).

Board foot: Unit of measurement represented by a 1 foot board, 1 foot wide, and 1 inch thick (Jenkins and Smith 1999).

Boles: The marketable stem of a tree.

Brake: “A heavy cypress stand” (Mattoon 1915: 46).

Check: A split in the heartwood of sinker logs resulting from different drying rates between the interior and outer wood of the log (Broussard 2005).

Figure 46: Sinker log (note wind-shake in the center and checks on the outer edges)

Clean cut: All merchantable timber removed between runs or spurs (Mancil 1972).
Coppicing: Vegetative reproductive method where a sapling/poles grow from stumps.

DBH: (Diameter at Breast Height) Tree diameter at breast height (4.5 feet).

Heartwood: Non-living center of a tree.

Homestead Act: 1862 Act that allowed a person to file a land claim for $1.25 an acre (Norgrass 1947).

Landscape: “1) The design of the landscape includes the features of the natural area, so-called, and 2) the forms superimposed on the physical area by the activities of man, or the cultural landscape. Man is the latest agent, and the most definitely recognizable one, in the fashioning of the earth’s surface” (Sauer and Leighly 1929: 10).

Monoecious: Plants that have both male and female flowers or cones.

Narrow-gauge rail logging: A small relatively light train that was used as an alternative logs rafting to transport felled timber. (Mancil 1972)

Overhead Cable System: A precursor method of cypress logging using a system of cables overhead to transport logs above the swamp floor. This system was replaced by the pull-boat method, but was still used in a limited capacity where narrow-gauge rail and/or pull-boat methods were not feasible (Mancil 1972).

Phenotypic plasticity: Variation in plants from growing conditions.

Phloem: Food transporting tissues of plants.

Pirogue: A canoe styled boat designed for shallow draft, often used in Louisiana.

Pull-boat: A boat used to skid logs across the swamp floor. Skidding was carried out via a two opposing winch system, a primary (pulling) winch and a messenger (return) winch (Mancil 1972, Sheets 2002).

Sapwood: Living wood of tree outside of heartwood.

Section 404 of the Clean Water Act: Allows for the application and issuing of permits, for procedures that may discharge dredge or fill materials into navigable waters (USACE 2005).

Shake: A condition caused by wind that cracks the heartwood of standing timber (Broussard 2005).

Sheave Block: A block attached to a spar to which a pulley is attached. The pulley is the used to connect two opposing winches located on a pull-boat (Mancil 1972).

Skidding: Method of timber transport from harvest locations by sliding the log across the land surface.

Southern Homestead Act 1866: “The object of the act was to end cash sales and to promote small landowners, such as freed slaves, poor whites, and impoverished immigrants on public land (Williams 1990: 240).” “The Homestead Act of…1866, provided that in Alabama, Mississippi, Louisiana, Arkansas, and Florida should be disposed of only under the provisions of the Homestead Act “(Norgrass 1947: 18).

Spar: A tree or stump used to anchor a sheave block (Sheets 2003).


Structuration: “An approach to social theory developed by British sociologist Anthony Giddens (b. 1938) that seeks to elucidate the intersections between knowledgeable and capable human
agents and the wider social systems and structures in which they are implicated.” (Gregory 2000: 798-800).

Trot Line: A line placed across a water body, usually a river or stream used in conjunction with multiple hooks and bait, to harvest fish.

Turbidity: “Sediment suspended in the water column” (Hughes, Kelso and Rutherford 1997: 27).
Appendix B: Narrow-Gauge Rail System

The use of narrow-gauge railway skidding did not contribute significantly to the loss of logs during float transit. Rail lines were often used when the distance of a cypress stand from a water body was significant enough to prevent profitable construction of a pull-boat run (Mancil 1972). Rail lines were constructed atop a dirt bed of stable soils, a five to six feet thick meshwork of dunnage (mill residue) and crib layer timbers (Mancil 1972). Spurs were designed to pull logs six to eight hundred feet from the tracks and were spaced twelve to sixteen hundred feet apart (Mancil 1972). This layout allowed a “clean cut” that would result in all marketable timbers harvested between each spur (Mancil 1972). Each spur had an estimated cost of nine to fifteen thousands dollars per mile (Mancil 1972).

Cypress rail logging was a relatively quick operation (Mancil 1972). The skidder was located on a rail car and spars were most often portable metal towers that could be set up in a short time (Mancil 1972). Because the logs were transported above ground the operation was more efficient, and there was no need to snipe logs or create pull runs and logs were transported at a rate of six hundred feet per minute (Mancil 1972).
Appendix C: Over-Head Cable System

The over-head cable system was an early method of removing cypress developed by Horace Butters that predated the Baptist pull-boat system (Mancil 1972). The Over-head system was not nearly as efficient when used in conjunction with raft transportation, but became the method used primarily with narrow-gauge rail.
Appendix D: Application Process

Any navigable waterway must obtain a permit from the US Army Corps of Engineers. If the operation is conducted within the state coastal zone boundary then the Louisiana Department of Natural Resources will act as a central location to get approval from the Army Corps of Engineers, LDNR and LDEQ. Lastly, permission must also be obtained for any operation taking place in a Scenic Waterway as defined by the state.
Appendix E: Wet Pine Savannas

Wet pine savannas are rare habitats where pondcypress may be found. Once abundant, little of wet pine savannas remain in Louisiana, since most of the habitat has been converted to timber tracts. Wet pine savannas habitats have some of the highest plant diversity in North America. They are fire maintained habitats, predominantly poorly drained, sandy-wet, have low pH, and contain an abundance of carnivorous plants.
## Appendix F: Cypress Species Associations

Table 3: Cypress Species Associations

<table>
<thead>
<tr>
<th>Cypress Swamps</th>
<th>Wet Pine Savannahs</th>
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<tbody>
<tr>
<td><em>Nyssa biflora</em></td>
<td><em>Acer rubrum</em></td>
</tr>
<tr>
<td><em>Nyssa aquatica</em></td>
<td><em>Andropogon glomeratus</em></td>
</tr>
<tr>
<td><em>Itea virginica</em></td>
<td><em>Aristida sp.</em></td>
</tr>
<tr>
<td><em>Acer rubrum</em></td>
<td><em>Cephalanthus occidentalis</em></td>
</tr>
<tr>
<td><em>Cephalanthus occidentalis</em></td>
<td><em>Chasmanthium sp.</em></td>
</tr>
<tr>
<td><em>Acer negundo</em></td>
<td><em>Ctenium aromaticum</em></td>
</tr>
<tr>
<td><em>Salix nigra</em></td>
<td><em>Drosera brevifolia</em></td>
</tr>
<tr>
<td><em>Taxodium distictum</em></td>
<td><em>Helianthus heterophyllus</em></td>
</tr>
<tr>
<td><em>Cornis stricta</em></td>
<td><em>Hypericum galioides</em></td>
</tr>
<tr>
<td><em>Cornus drummondii</em></td>
<td><em>Ilex glabra</em></td>
</tr>
<tr>
<td><em>Ulmus americana</em></td>
<td><em>Ludwigia sp.</em></td>
</tr>
<tr>
<td><em>Carya ovata</em></td>
<td><em>Magnolia virginiana</em></td>
</tr>
<tr>
<td><em>Celtis laevigata</em></td>
<td><em>Nyssa biflora</em></td>
</tr>
<tr>
<td><em>Quercus nuttallii</em></td>
<td><em>Osmunda cinnamomea</em></td>
</tr>
<tr>
<td><em>Forestiera acuminata</em></td>
<td><em>Quercus laurafolia</em></td>
</tr>
<tr>
<td><em>Persea palustris</em></td>
<td><em>Taxodium distictum</em></td>
</tr>
<tr>
<td><em>Quercus laurafolia</em></td>
<td><em>Taxodium ascendens</em></td>
</tr>
<tr>
<td><em>Fraxinus tomentosa</em></td>
<td><em>Woodwardia virginica</em></td>
</tr>
</tbody>
</table>
Appendix G: Cypress Tree Ring Dating

Cypress trees may produce “false rings” that will mislead persons attempting to accurately date the tree, possibly due to a reduction in metabolic rate during flooded conditions (Brown and Montz 1986).
Appendix H: Lawsuit Against Swamp Logging

Seven environmental groups are attempting to stop a cypress harvesting operation of 3,000 acres in the Lake Maurepas region (Schleifstein and Grabell 2002). The United States Environmental Protection Agency has ruled in favor of the logger, citing “they met the definition of silviculture”. Glen Miller, owner of the logging operation, plans to harvest only in areas 150 feet from waterways, use helicopters to remove logs and leave at least 100 trees per acre (twelve being mature seed producers) (Schleifstein and Grabell 2002). Since then, the US Army Corps of Engineers has enacted an old “Harbors Act” to halt the operation (Buchart 2005).
Appendix I: Formosan Termites

Formosan termites (an invasive species from Asia) will attack cypress (Goyer and Henderson 1992), but it is unclear to the author as to whether or not Formosa termites will attack old growth and/or sinker cypress. The relationship between cypress tree destruction and termite invasion is not well understood, whether Formosan termites attack dying trees or do the termite attacks destroy the trees (Goyer and Henderson 1992).
Appendix J: Cypress Knees

Cypress knees are source of mystery to many botanists. The purpose of cypress knees has been narrowed to three functions: starch storage (Brown and Montz 1986), stability (Platt 1965), and respiration or aeration (Mattoon 1915).
Appendix K: The Landscape Never Lies

When discussing the topic of the truth that lies therein the landscape, the author is speaking of rural landscapes as opposed to controlled landscapes. Some scholars believe that the truth of a controlled landscape is not as open as others. Mitchell (2000) implies that controlled landscapes, cities, malls, downtown regions, etc, erase or actively minimize the social struggles and relationships that went into its making. This is not to say that rural landscapes are not controlled, but the truth can sometimes be more readily apparent in rural or less developed landscapes.
Vita

Christopher Aubrey Hurst was born on October 24, 1972, in Hammond, Louisiana. He spent his childhood in small town of Springfield, Louisiana, and graduated from Springfield High School in 1990. At the age he seventeen joined the United States Navy and served onboard the U.S.S. Tautog SSN639, 637 Class Attack Submarine, as a sonar operator in the Pacific fleet while stationed at Pearl Harbor, Hawaii. After five years he was honorably discharged from the Navy and returned to Louisiana to begin his studies at Louisiana State University. In 2001 he graduated with a Bachelor of Science in environmental management systems with minors in forestry and wildlife and fisheries conservation. In the spring semester of 2002 he entered the geography and anthropology graduate program at Louisiana State University. He graduated with a Master of Arts in environmental geography in August 2005.