LOST LIGHTNIN': MOONSHINE IN ALABAMA AS REPRESENTED IN THE ARCHAEOLOGICAL RECORD

by

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ABSTRACT

Moonshine stills are commonly discovered during archaeological surveys and excavations across the southeastern United States, where moonshine production holds historical economic importance. These sites are recorded occasionally, but little investigative research is done because of a prevailing assumption that stills can offer nothing of historical significance. The present thesis, however, seeks to demonstrate that this assumption is not correct. Alabama is an ideal state for the archaeological study of moonshine still sites. Stills are recorded in the Alabama State Site File and some preliminary investigations of moonshine were completed in the late 1970's, thus providing a base of information to facilitate further investigation toward the goals of this these. The major objectives of this thesis include establishing a chronology and typology of stills, identifying settlement patterns, and determining land use patterns associated with still locations across Alabama.

The results of this thesis reveal that moonshine stills can be sorted into types and dated, and that settlement and land use patterns are identifiable in the archaeological record. I conclude that transitions in the legal status and socioeconomic importance of moonshine production in Alabama are clearly demonstrated and can be identified in the archaeological record. This research contributes to the study of historic archaeology in Alabama, as well as the anthropological investigation of alcohol and its production and distribution.

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CHAPTER 1

INTRODUCTION

Abandoned moonshine still sites are a common discovery during archaeological surveys across the southeastern United States. These sites are often only briefly described during a survey report, if not ignored entirely. In Alabama, 107 of these sites are recorded in the Alabama State Site File, run by the University of Alabama's Office of Archaeological Research. These sites range in date from the late 19th century to the middle 20th century, and all were found during archaeological surveys – many in rock shelters, drainage ways, or national forests.

Archaeological analysis of moonshine stills needs to move beyond basic, and often cursory, descriptions. Much information exists about settlement patterns of illicit activities, historic subsistence practices and cottage industries, and how the tradition of moonshine production both continued and changed throughout the 19th and 20th centuries. The aim of this project is to analyze the settlement patterns and basic chronology of moonshine production in Alabama through examination of site location, still components, still type, and other artifacts found at each of the 107 still sites in the Alabama State Site File.

Because little archaeological research has focused on moonshine production, basic questions pertaining to dating and the development of certain still characteristics and types have not been addressed. There has been much research into moonshine production and distribution by historians (Miller 1989; Pierce 2013; Rorabaugh 1979; Stewart 2006, 2011; Thompson 2011),

and by anthropologists interested in the cultural impact and significance of the tradition of moonshine production (Hatch 2004; Peine and Schafft 2012; Poole 2002), but these investigations have not examined the material culture left behind when stills are abandoned.

Archaeologists have turned their attention to alcohol (McGovern 2003, 2009; Smith 2008), and a few have examined historic home distilling and moonshine production (Blitz 1978; Douglas 2001, 2004; Horning 2000, 2002), but this research has not yet produced a chronology for moonshine production sites or settlement patterns on a more regional scale. The 107 sites used for this project have not been examined as a whole, and individually very little about each site has been studied beyond the initial description for the report. These sites can still benefit from a culture-historic approach of determining a basic chronology and typology for moonshine stills. Land use analysis of these sites can address specific social issues associated with moonshine production, such as the methods behind hiding illicit substance production or adaptations to different environments in different areas of the state. Patterns discerned through a land use analysis could also be compared to more modern illicit substance production sites, such as marijuana or methamphetamine, to determine if they are still applicable or are potentially passed down through criminal networks that originated during the Prohibition Era.

Site location, still components, and still type are productive units of analysis for determining a basic chronology for these sites and for identifying settlement patterns. Site locations, including easting and northing coordinates and elevation, can be used through Geographic Information Software (GIS) to map all sites and determine if there are any clusters in specific areas. Still components and other artifacts found at the site, such as syrup cans, car radiators, glass, or crockery, can be used to determine a relative date for the site, and can then be compared to other sites to develop a relative chronology for moonshine production in the region

(Blitz 1978: 97). Finally, still type can be examined to determine if specific types were used in particular environments or during different time periods to establish further the typology of moonshine stills and the development and spread of the tradition.

Examining settlement patterns and developing a chronology for moonshine production in Alabama inform the research objectives of this thesis. The major objectives of the project are as follows: 1) discern when in time the site was used as measured by still components and other artifacts; 2) interpret whether still type changes based on location or time period; 3) interpret settlement patterns of moonshine production in Alabama through the use of GIS software mapping tools, and through identifying common patterns in the county in which the site is located, elevation, or type of water source; and 4) identify and interpret land use patterns around still sites to determine what adaptations moonshiners made as the industry became illegal. Although moonshine stills are a common discovery during surveys, and are often documented, their potential for providing further information about past lifeways and practices has not received much attention (Blitz 1978; Horning 2002).

In Chapter Two, the history of moonshine production in the Unites States is introduced, giving a brief description of the research. I follow this with an introduction to the archaeological study of alcohol, with a discussion on how major themes in the overall study influenced and helped to formulate my own analysis. Finally, I focus on specific archaeological investigations of moonshine production in the Southeastern United States, including Virginia, Tennessee, and Alabama. These case studies are provided as examples of analyses of moonshine still sites on a smaller scale than this project, and mainly focus on either a few sites or sites located in a specific locale, such as abandoned mines.

In Chapter Three, I present the theoretical framework for this research: alcohol

production as a reflection of political economy. Anthropological investigations of alcohol production and distribution have followed this framework before (Smith 2005), made popular by Sidney Mintz's *Sweetness and Power* (1985). Moonshine production in the southeastern United States has traditionally been a vitally important economic endeavor. As such, political economy is a useful theoretical framework for investigation.

Chapter Four presents the methods of acquiring data. I explain how the sites were chosen for analysis and used to explore the research objectives. First, I present the methods used to place the sites into specific time period categories, then the methods used to map sites and interpret settlement patterns are described, and finally the methods used to identify specific still types and their distribution are explained.

Chapter Five is also organized by research objective, and presents the analysis and results. The first section dates the still components and artifacts used to create a relative chronology and typology for the entire sample. Whether still type changes are due to regional preferences or time period advancements is also discussed. The second section identifies specific clusters found in the spatial distribution, as well as trends in elevation and chosen environments for moonshine production. The third, and final, section identifies what land use patterns were found in association with still sites, and how these patterns demonstrate adaptations either to the shift from home production to illegal production of moonshine or to different physical and social environments.

Finally, Chapter Six offers conclusions based on the basic assumptions used by previous researchers of moonshine production in both the disciplines of history and archaeology. The discussion focuses on how the 107 moonshine still sites found in the Alabama State Site File relate to the three research objectives. I demonstrate that while moonshine sites are primarily

ignored in the archaeological record, they can provide a wealth of information about past lifeways and subsistence practices. The final chapter also demonstrates how this thesis fits into archaeological investigations of alcohol production and the future implications of examining the settlement patterns of illicit activity.

CHAPTER 2

SOUTHEASTERN MOONSHINE PRODUCTION RESEARCH IN HISTORY AND ARCHAEOLOGY

Moonshine Production and Distribution in Historical Research

Moonshine production in the United States has been a subject of study for historians, geographers, journalists, novelists, anthropologists, and sociologists. Historians have primarily focused on early colonialism, the Whiskey Rebellion, Post-Civil War era Revenue Taxing, Prohibition, and the origins of NASCAR (Abbott 2004; Miller 1989; Pierce 2013; Poole 2004; Stewart 2006, 2011). Journalists have produced historical accounts, primarily from the Prohibition era, of moonshine producing families and large criminal distribution networks (Bondurant 2008; Dabney 1979; Thompson 2011). They have also covered more modern instances of moonshining in the 20th Century – including newspaper articles on police raids or collections of anecdotes and stories about moonshine production and distribution after Prohibition ended (Robinson 2016; Shearer 2011; Taylor 2016).

The origins of distillation[1] are somewhat obscure. The process most likely evolved from the distillation of wines in Greece for medicinal purposes (Dietler 2006: 232). Distillation was also reported by the Romans, Arabs, and in Britain before the Roman Conquest, but the process was limited. The distillation process was spread by contact with the Moors during the 8th

[1]The process of distillation involves heating a liquid to the point of evaporation, collecting it, and condensing it back into liquid form in order to purify or separate it. For moonshine, a 'mash' made of corn, sugar, and water is allowed to ferment, and then is heated until the alcohol evaporates. The vapor moves from one container through a tube to another empty container, where it is condensed into a more highly concentrated (higher proof) liquid.

Century, and eventually it became widespread throughout Europe, and was practiced by monks, craftsmen, and farmers (Greene 2014). In the United States, the production of distilled alcohols was brought over by colonists during the 16th and 17th centuries, and is typically attributed to colonists from the British Isles (Horning 2002; Meacham 2009; Peine and Schaftt 2012; Pierce 2013; Stewart 2011). In early America, every home needed a way either to brew beer or distill fruits and grains into alcoholic beverages. Usually wives were responsible for both of these processes because they were performed in the kitchen, while men were responsible for managing the fields or other concerns outside the home (Meacham 2009: 27-28). Unsafe drinking conditions of both water and cow's milk made domestic alcohol production necessary for survival (Meacham 2009: 12; Rorabaugh 1979: 97-99). Due to this necessity, brewed and distilled alcoholic beverages held great cultural importance and were often shared at community and social events, such as barn raisings and elections (Blitz 1978; Pierce 2013; Rorabaugh 1979: 19-20; Stewart 2006: 470, 2011).

Distilled whiskey and brandy gained socioeconomic importance when markets opened up for the sale and distribution of homemade products. This was fostered by higher taxes on imported alcohols like rum, wine, and British-made whiskey (Meacham 2009; Smith 2008: 52-54). Domestically distilled alcohol became popular because of its low price and wide availability (Pierce 2013; Rorabaugh 1979: 32-33; Stewart 2011). Corn was commonly grown by subsistence farmers, as were fruit orchards. Extra corn or fruit could easily be distilled at home and sold at markets or general stores in order to earn additional money during harvest seasons (Pierce 2013; Stewart 2006: 460-463). Corn was also easier to transport once distilled into whiskey than when it was packaged in bushels, and it sold for a higher price (Hatch 2004; Pierce 2013; Stewart 2006: 460-461). New economic opportunities moved the practice of

distilling from the domestic sphere to the commercial market and, therefore, out of women's responsibility and into the hands of men. During the 18th and 19th centuries, domestic whiskey was so popular in the United States that the government established a tax in order to boost domestic revenues (Abbott 2004; Dabney 1979: 58-73; Durand 1956: 180; Pierce 2013; Rorabaugh 1979; Stewart 2011). This sparked both the Whiskey Rebellion of 1791 and the development of illegal moonshine production (Dabney 1979: 58-73; Hatch 2004; Miller 1989; Rorabaugh 1979: 52-55).

Home distilling continued into the 19th century, and distilled whiskeys and brandies continued to play vital roles in community events and the southern economy (Dabney 1979; Hatch 2004; Miller 1989: 215-216; Stewart 2006). Home distilling proved to be the only method for making money in many southern mountainous areas, and distilled whiskey was even used as currency at many stores during the antebellum period (Miller 1989; Stewart 2006: 561, 2011; Thompson 2011). From the 1830's through the late 1850's, stigmas had not yet been attached to homemade whiskey and brandy, since there were no laws against it at the time (Dabney 1979; Hatch 2004; Miller 1989; Stewart 2006). Stills were most commonly located on public or unowned land near the home or, if farther away, on private property. Most subsistence farmers kept distilling equipment (Horning 2002: 141-142) and many had enough stills running to be counted as a distillery on the national census (Durand 1956; Miller 1989). American drinking patterns in the early 19th century were very distinctive. From 1790-1830 Americans drank more alcohol than has ever been recorded in the United States before or since, thus demonstrating the cultural and socioeconomic importance of alcohol consumption and production (Pierce 2013; Rorabaugh 1979: ix-xi, 8,; Stewart 2011). Distilled alcohol continued to be consumed at social events and the use and abuse of alcohol began to

spark the rising interest in and association with temperance societies (Stewart 2006: 468). However, even though the Temperance Movement began to become popular during the 1840s (Thompson 2011:10), many churches and legislators did not take any action against distillers or other alcohol producers because most of their financial support came from distilling profits (Abbott 2004; Miller 1989; Pierce 2013; Rorabaugh 1979; Stewart 2011) Preachers themselves occasionally had been involved in distilling before the Temperance Movement (Dabney 1979: 71).

During the 1860's, another excise tax of $1.10 per gallon on whiskey was introduced in the United States in order to generate revenues during the Civil War (Dabney 1979: 74; Miller 1989: 215). While home distilling had existed long before the 19th century in southern Appalachia, a new type of distilling began almost immediately as a reaction to this tax (Hatch 2004; Miller 1989). Moonshine production first began to flourish during this period, as stills were moved to hidden locations and further away from private property and towns. Many registered stills were only legally operating during the day – or specifically only on the day of the revenue inspector's visits – while producing illicit whiskey at night along with the fulltime illicit distillers in southeastern United States (Dabney 1979: 76).Technological advances in distilling made during the early 19th century – namely the use of a hydrometer, saccharometer[2], and thermometer (Stewart 2006: 468) – allowed for higher quality products to be made, even when distilling moved to more backwoods locations. Water-powered grist mills became centers of communal activity and were not only used to grind corn for distilling purposes, but also to make flour and corn meal for baking. Community members, especially men, gathered at grist mills to talk and share moonshine (Dabney 1979: 70). Distilled alcohol still had a very high degree of social importance, even as temperance societies gained a strong foothold and

[2] A sacchorometer is a hydrometer used for measuring the sugar content of a solution.

states began to pass prohibition laws (Dabney 1979: 103; Miller 1989; Pierce 2013; Stewart 2011).

In the mountainous region of southern Appalachia, alcohol production was one of the region's first industries (Miller 1989; Peine and Schafft 2012; Pierce 2013; Stewart 2006). Moonshine production during the late 19th Century, referred to as *blockading*[3], fostered social cohesion and was mainly practiced as a family business. Moonshiners preferred the term blockading because they saw a connection between bootlegging illegal alcohol and Civil War era smugglers running Union port blockades to provide supplies to the Confederacy (Pierce 2013).

Women tended to support their menfolk in distilling, and even acted as bootleggers and moonshiners themselves (Dabney 1979: 77-80; Miller 1989:199). Southerners were divided between support for the revenue tax and support of local blockaders. Many felt that even though they disagreed with the tax that the law must still be followed (Miller 1989: 206-207). Moonshiners and their supporters formed groups focused on intimidation to prevent community members from becoming reporters, that is, people who would apprise the authorities about moonshining activities. One such order that formed in Pickens County, Georgia in 1889 was known as "The Honest Man's Friend and Protector." They dressed in hooded robes, much like the Ku Klux Klan, and would set fire to homes of suspected informers (Dabney 1979: 77).

Reporting on moonshiners also became a way for neighborly feuds and family issues to be solved by outsiders during the late 19th and early 20th centuries. Neighbors may have reported each other as an act of vengeance or wives may have become fed up with drunken abusive episodes (Miller 1989; Pierce 2013; Stewart 2011; Thompson 2011). Law enforcement

[3] The term blockading connects southern moonshiners to Civil War blockade runners that carried supplies to towns and armies in the Confederacy behind Union barriers.

also became much more efficient during this period (Dabney 1979). By issuing sentences of both harsh punishment for violent resistance and large operations and leniency for minor offenders, the government was able to present itself as powerful and forgiving at the same time (Miller 1989: 211). This efficiency, coupled with the rise of local color writing – a genre which over-emphasized and exaggerated Appalachian stereotypes – caused a shift in the popular view of southern Appalachia. Dialect, low education levels, moonshine production, and other illegal activity were overplayed while authors attempted to preserve the memory of some of the local legends and historical figures. The movement of industry into the region brought about the development of a middle class, and with that came the introduction of progressive thinking. Progressives saw mountain frontiersmen as "backwards" and mountain towns as "contaminated with illegal moonshine" (Hatch 2004: 80; see also Miller 1989: 213; Pierce 2013).

By 1916, all states in the United States had passed prohibition laws except for Missouri and Kentucky (Miller 1989: 216). Ironically, the Temperance Movement, Progressives, and Prohibition created a unique opportunity for moonshine production to reach its highest level of socioeconomic and cultural importance (Dabney 1979: 103; Horning 2002: 142; Stewart 2011). As early as 1910, outsiders were coming to the southern Appalachian Mountains to view what they saw as a "backwards 18th-Century lifestyle" still functioning in the 20th Century (Hatch 2004; Horning 2000; Semple 1910: 561-565). No legal alcohol could be purchased, making moonshine even more valuable, especially during the Great Depression (Pierce 2013; Stewart 2011; Thompson 2011). Moonshine production became even more socioeconomically important during this time, as cash was hard to come by (Dabney 1974, 1980; Pierce 2013; Shearer 2011; Thompson 2011). Technological advances in still design occurred during this period as well, most notably the addition of a thump keg (Dabney 1974; Douglas 2001; Pierce 2013; Stewart

2011). A thump keg is a second heated container attached by pipes between the main boiler and the condenser. The first run of alcohol produced by the still, called the 'singlings,' is put into the thump keg and heated until it vaporizes – just like the mash in the boiler (Stewart 2006: 458).

This process enabled moonshiners to effectively produce alcohol with a higher proof at a faster rate and, therefore, charge more for it. Once Prohibition ended, however, the price of bonded (legally sold) whiskey fell below that of moonshine, causing its socioeconomic importance to decline accordingly (Blitz 1978: 100; Pierce 2013; Stewart 2011; Thompson 2011). Thus, by the mid-20th Century moonshine's general significance in the southeastern United States had greatly diminished. Moonshine production had dwindled to personal consumption (Peine and Schafft 2012: 100-101) and to sales in lower socioeconomic urban areas (Blitz 1978: 100). Several changes occurred within the production process itself during this period, including the use of molasses and sugar rather than corn as the main ingredient. Other innovations included the deployment of plastic hoses, the use of car radiators as condensers (Blitz 1978; CDC 1991: 294), and the addition of substances like Purex to speed up the distillation process up or to increase the alcohol content of the final product. Bootleggers and blockading became romanticized views of the past – some of which influenced the formation of stock car racing, which is the origin of today's NASCAR races (Poole 2002: 3). The tradition of modifying cars to make them travel at faster speeds in order to evade law enforcement evolved into racing on dirt tracks, and eventually into modern NASCAR races.

Today, moonshine is experiencing something of a cultural renaissance, with the availability of legal moonshine in stores. Legal distilleries have sprung up all over the South, including in Virginia, Tennessee, South Carolina, and Alabama. Popular references to moonshiners occur on the discovery channel's *Moonshiners* television show and several

documentaries about such moonshine legends as Popcorn Sutton (Pierce 2013). Moonshining, once thought to be a dying traditional skill (Blitz 1978: 100; Douglas 2004; Shearer 2011; Thompson 2011), is once again undergoing a transformation in socioeconomic and cultural importance.

The Archaeological Study of Alcohol

The archaeological study of alcohol has covered a variety of topics, including production, distribution, trade, transport, and consumption (Blitz 1978; Douglas 2001, 2004; Horning 2000, 2002; McGovern 2003, 2009; Smith 2005, 2008). Archaeologists who focus on alcohol have examined such topics as discovering the prehistoric origins of intentional wine and beer production (e.g. McGovern 2003, 2009), rum production on Caribbean plantations (e.g. Smith 2005), moonshine production in Tennessee caves and early 20th-century Virginia (e.g. Douglas 2001, 2004; Horning 2000, 2002), and moonshine production in Alabama (e.g. Blitz 1978).

Alcohol studies within the field of archaeology provide a unique perspective from which to view processes of domestication, industrialization, commercialization, gender roles, class identity, and regional identity (Meacham 2009; McGovern 2003; Dietler 2006; Smith 2008). Historical archaeology is better suited to examine alcohol-related research questions than prehistoric archaeology because of the different types of resources available to historical archaeologists (Brown 1994; Deagan 1988; Smith 2008; Watson 1990).

The parameters for historic archaeology were set at the Conference on Historic Sites Archaeology in 1967 (Deagan 1988: 7), and since then historical archaeology has continued to be a major focus in the field of archaeology as a whole (Brown 1994: 59; Cobb 2014; Deagan 1988; Smith 2008; Watson 1990). It has been argued that the particular “niche” of archaeology is

to study the processes and interrelationships that helped to develop and evolve human social and economic organization (Deagan 1988: 8). In this case, the study of alcohol production, trade and transport, and consumption is particularly suited to historical archaeology because historical archaeologists have access not only to the material culture remains of these processes, but also to documentation in the form of personal accounts, trade and transport records, probate inventories, and bookkeeping records (Deagan 1988: 9-10; Horning 2000; Smith 2008). The historic archaeology of alcohol and drinking provides a particular set of research questions and goals that are specifically oriented within this "niche" (Dietler 2006: 230-231; Smith 2008).

While the archaeology of alcohol and drinking has covered a multitude of time periods, alcohol types, and subjects, the specific examination of illicit alcohol production within the field of archaeology is severely lacking. It has been argued that questions relating to general cultural phenomena that transcend time and space are also appropriate to the particular capabilities of historic archaeology (Deagan 1988: 7-8; Smith 2008). Alcohol production and, in particular, illicit alcohol production, falls under this category (Durand 1956; Horning 2000; McGovern 2009; Pierce 2013; Smith 2005). Exploration of illicit alcohol production within historic archaeology has been primarily limited to illicit production as a rebellion for subjugation or taxation (Horning 2002; Smith 2005) or through focusing on the presence of subversive culture in archaeological material (Dietler 2006). Specifically, in the United States, detailed analyses of moonshining in the recent past has not happened. As stated earlier, moonshine still sites are primarily mentioned on a presence or absence basis in survey site reports with no further examination or explanation (Horning 2002).

The Historic Archaeology of Moonshine

The historic archaeology of moonshine has been fairly limited. Most studies of moonshine production have typically been the focus of research by historians (e.g. Pierce 2013; Stewart 2011). In particular, Frederick H. Smith (2005) examined whiskey and moonshine distillation in his overarching work *The Archaeology of Alcohol and Drinking*. Audrey J. Horning (2000, 2002) studied moonshine production by the former inhabitants of Shenandoah National Park in Virginia while working on the Survey of Rural Mountain Settlement project. The locations of moonshine production, specifically the various industrial uses of caves, in Tennessee was the focus of Joseph C. Douglas's research (2001), and the history of moonshine production in Alabama was examined by John H. Blitz (1978). While Smith's work is primarily an overview of the field of alcohol related archaeology, the sites discussed by Horning, Douglas, and Blitz were primarily discovered through archaeological surveys.

Despite being found during surveys, it is important to recognize that moonshine stills are not necessarily the primary focus of research. Within the works of these authors, further analysis of moonshine stills occurs for one of three specific reasons. In Horning's (2000, 2002) work in Shenandoah National Park, legal distilleries and illicit prohibition era stills were discussed because the goal of the project was to present a full picture of rural life in the Shenandoah Valley of Virginia, specifically in contradiction to popular Appalachian stereotypes. Douglas (2001, 2004) examined all of the industrial uses of Tennessee caves, of which moonshine production was a primary component. Finally, Blitz (1978) discovered many moonshine still sites during regional surveys, and spoke with informants in order to produce a more detailed analysis of the history of moonshine in Alabama. A common theme throughout these articles is that moonshine still sites can provide valuable cultural information about the recent past, and that this

information is being lost through lack of attention, preservation, and research (Blitz 1978; Douglas 2004; Horning 2002; Smith 2008).

Summary

Much of the research on moonshine production and distribution to date has been completed by historians and journalists. Archaeological investigations of moonshine production have focused on its status as a cottage industry or as a disappearing craft (Blitz 1978; Douglas 2002, 2004; Horning 2000, 2002), yet moonshine, both legal and illegal, is still common today (Robinson 2016; Taylor 2016). A more comprehensive archaeological examination of the material remains of moonshine stills could reveal more about its history as a subsistence practice in the rural southeastern United States, the technological advances of cottage industry, and the behavioral patterns associated with illicit activity.

CHAPTER 3

ALCOHOL PRODUCTION AS POLITICAL ECONOMY

Alcohol has been studied in many facets of archaeological and anthropological research (Blitz 1978; Dietler 2006; Douglas 2001, 2004; Heath 1987; Horning 2000, 2002; McGovern 2003, 2009; Mintz 1986, 2011; Nöel Hume 1974; Smith 2005, 2008). Studies have covered topics ranging from early human evolution and production of alcohol (McGovern 2003, 2009), commodities and political economy (Dietler 2006; Heath 1987; Mintz 1986, 2011; Smith 2005), colonialism (Nöel Hume 1974; Smith 2008), household and community studies (Horning 2000, 2002), and cottage industries and industrialism (Blitz 1978; Douglas 2001, 2004).

Anthropological investigations of alcohol have proposed such research questions as "Why do people drink?", "What purpose does drinking serve cross culturally?", "What are the origins of alcohol production and drinking?", "What role does alcohol play economically?", and "Can alcohol production and consumption be used as a form of resistance?". Anthropologists have contributed to the larger body of work in alcohol studies through investigations of alcohol in such topics as social identity construction, colonialism, postcolonial economies, gender roles, human origins, and class distinctions. Anthropology is a uniquely suited discipline for investigations of alcohol production and consumption because the four-field approach allows for the study of both the human past and present.

Overviews of alcohol studies in anthropological and archaeological theory were produced

by Dwight B. Heath (1987) and Michael Dietler (2006) in the *Annual Review of Anthropology*.

Dwight B. Heath discussed anthropological challenges to the alcoholism-and-addiction mainstream literature, which supported the construction of all alcohol as a collectively harmful and dangerous substance (Dietler 2006:230; Heath 1987), and focused more on newer – at the time – investigations of alcohol through the lens of normal drinking practices. Anthropologists instead argued that alcohol was a fully integrated, embodied, and culturally valuable good (Dietler 2006: 230; Heath 1987). Dietler (2006) focuses on what anthropological research occurred since Heath's original overview, most specifically on cultural understandings of drinking practices, highlighting ethnocentrism in other works, alcohol's role in colonial and postcolonial political economy, and sustained archaeological work on the ancient past and feasting (Dietler 2006:230-231).

Heath (1987) and Dietler (2006) point out that a longstanding theme in anthropological investigations of alcohol has been social cohesion and identity (Dietler 2006:235; Heath 1987). Dietler asserts that more recent research has focused on the role drinking plays in constructions of social identity through the formation of communal rules surrounding drinking, common drinking practices that differ between social groups, and dominant types of alcoholic beverages consumed within specific communities (Dietler 2006:235-236). He discusses how drinking practices and access to different alcoholic beverages reinforce class distinctions, and the role of alcohol in colonial political economy (Dietler 2006:235, 237-241). Cognates for many of the points made by Dietler (2006) in this discussion on alcohol and political economy can be seen through the archaeological investigation of moonshine production – some of which he references himself. Specifically, the amount of agricultural resources dedicated to producing alcohol can be seen in the ingredients used to produce moonshine. The work feast – which involved an entire

community gathering together for a building project or harvesting of resources being paid by the building or land owner with a large feast of alcohol and food – occurred numerous times in the form of barn raisings or harvest festivals. Finally, the sale of alcohol to produce state revenue and alcohol as a "major component of a subversive alternative economy (i.e., bootleg production, smuggling, etc.) (Deitler 2006:239)" are both associated with alcohol's prohibition, subsequent appeal, and the entire basis for moonshine's economic importance.

Anthropological archaeologists have examined the material culture associated with alcohol from prehistoric and historic societies. Patrick McGovern has worked to refine the chronology of alcohol production in the deep past through a focus on the earliest known wine and beer productions in the world (McGovern 2003, 2009). In *Ancient Wine: The Search for the Origins of Viniculture* (2003), McGovern uses archaeological, chemical, and DNA evidence to present an overview of viniculture both historically and prehistorically (McGovern 2003). In *Uncorking the Past*, he examines the origins of alcohol production around the world – including grape domestication for wines, corn beers in the Americas, sorghum drinks in Africa, and European beers (McGovern 2009). While archaeological studies of alcohol in prehistory have primarily focused on alcoholic beverages as a major component in ritual and feasting, and therefore were produced with an intent for immediate consumption (Dietler 2006), McGovern's research also focuses on one aspect of alcohol that made it vitally important for the survival of early colonists, and later for postcolonial economics: the ability to store and easily transport alcoholic beverages without spoilage (McGovern 2003, 2009).

The ability to transport alcohol across long distances would become necessary for colonial survival and economics. Early explorers of the Americas traded alcohol to Native Americans, along with other goods (Rorabaugh 1979). Early New World explorers and colonists

had not been exposed previously to the bacteria present in the fresh water of North and South America and the Caribbean, making alcohol transportation and production a necessity for survival; the water itself was too dangerous to drink (Meacham 2009; Rorabaugh 1979). Sarah Hand Meacham discusses the importance of brewing and distilling in early Colonial life in her book *Every Home a Distillery* (2009). She couples the archaeological evidence of brewing and distillation equipment in early colonial homes and kitchens in the Chesapeake with historical advertisements by colonists searching for wives who could brew beer or distill liquors like fruit brandies. Ivor Nöel Hume determined the types and chronologies of alcohol bottles found throughout Colonial Williamsburg, particularly within wells where trash was dumped behind taverns. He discussed all of the bottle types found in Colonial Williamsburg in "History in a Green Bottle", a chapter in *All the Best Rubbish: Being an Antiquary's Account of the Pleasure and Perils of Studying & Collecting Everyday Objects from the Past* (1974:173-203). The most common glass came from green wine bottles. Nöel Hume presents the many different types shipped to the colonies from all over Europe throughout the 17th and 18th Centuries found in Colonial Williamsburg (Nöel Hume 1974). Frederick H. Smith examined how one specific alcoholic beverage changed global economics in *Caribbean Rum* (2008). Smith builds on other investigations of commodities and the triangle trade in the Caribbean, in particular Sidney Mintz's many works discussing sugar and power (Mintz 1986). He uses archaeological and historical evidence to examine fully the importance of rum for European colonial powers, enslaved Africans, and indigenous Caribbeans through the lens of the triangle trade, colonialism, subversive economies, and group identity formation (Smith 2008).

Postcolonial historical archaeology has also provided much research in anthropological alcohol studies. Archaeological investigations have covered taverns and exchange networks

(Nöel Hume 1974), multi-scaler examinations of households and communities (Horning 2000, 2002), industrialism and the use of natural resources (Douglas 2001, 2004), and rural cottage industries (Blitz 1978). Audrey Horning worked with the National Park Service-sponsored excavations of three of the mountain hollows in Shenandoah National Park, which focused on locating and analyzing the remains of 18th – 20th Century communities in three mountain hollows within the park (Horning 2002:129). Horning utilized probate records present for many of the families in these hollows, who were forced out of their homes during the formation of the national park (Horning 2000. 2002). She found many stills and distilling equipment were bequeathed to family members, especially wives or children, to ensure that they had the means to remain economically sound after a patriarch's death (Horning 2002:141). She argues that although the 18th-century stereotype of the Blue Ridge Mountains inhabitants as intemperate or lazy, the reality was that whiskey production in the region was geared more towards the market than personal consumption (Horning 2002:141). Before the production of alcohol was outlawed, whiskey production served as a legitimate and valued business in the region, and was one of the few ways people found to combat economic disadvantages (Horning 2002:141-142). Prohibition during the 20th Century provided the opportunity for illicit whiskey production profits – which in this case, predominantly came from sales made to the managers of a local resort (Horning 2002:142). Horning's research suggests that whiskey production was already deeply ingrained in the cycle of farm subsistence for the region, and that it was relatively easy for farmers to shift from legal to illegal production (Horning 2000; 2002:142-143).

Joseph C. Douglas examined the industrial uses of Tennessee caves during the historic period (Douglas 2001, 2004). He found that one of the most widespread industrial uses of caves throughout Tennessee was the production of illicit whiskey (Douglas 2001:258). Particularly in

caves with abandoned saltpeter mines, Douglas found that caves with a tradition of use were a common place for Tennesseans to set up illicit whiskey production (Douglas 2001:256-257). As Horning found in Virginia (Horning 2000, 2002), Douglas concluded that the illicit production of moonshine had grown out of the tradition of whiskey distilling that had long been practiced in the region (Douglas 2001:259). Moonshiners also continued to use spaces historically used for industrial production and resource extraction – but rather than saltpeter, they extracted water for their stills (Douglas 2001:259). John Blitz investigated moonshine production in Alabama through both examining the archaeological remains and speaking with local informants who were former moonshiners (Blitz 1978:92). His is one of the only archaeological investigations of moonshine to focus on still types and uses – specifically the pot still and groundhog still, both of which are found throughout the state of Alabama (Blitz 1978:95). Through informant interviews, Blitz was also able to determine some of the group identities and class tensions associated with moonshining, particularly during the 1970s (Blitz 1978). He asserted that moonshine production at the time was seeing a steady decline throughout Alabama and the rest of the United States due to the availability of affordable (and cheaper) bonded liquors, patented medicines, and the disappearance of the rural subsistence economy (Blitz 1978:99). Blitz argued the decline was seen in the product produced, and the new group of people who produced it in the 1970's: "Today in Alabama and the nation, most illicit liquor is not produced in the traditional way for consumption by friends and relatives. Now it is produced by professional criminals who sacrifice the basics of hygiene and quality to transport large quantities of frequently poisonous whiskey to the low income urban areas of the South" (Blitz 1978:100).

This tension between traditional methods of production and the overall criminalization of moonshine production after Prohibition can be seen not only in the archaeological record but also

in historical and anthropological research (Blitz 1978; CDC 1992; Dabney 1974, 1980; Peine and Schaft 2012). Researchers of moonshining in the southeastern United States have asserted that the art of distilling is "dying" or "changing" numerous times, when in actuality it is undergoing yet another transformation while remaining an important component of the political economy in the region (Blitz 1978; Dabney 1974, 1980; Peine and Schaft 2012; Pierce 2013; Shearer 2011). Much like the earlier shift from traditional, legal whiskey distillation supported by the rural subsistence economy to illicit moonshine production based on these same economic structures during Prohibition, more recent moonshine production is the product of extensive criminal networks across the United States (Blitz 1978; Peine and Schaft 2012; Pierce 2013; Shearer 2011; Thompson 2011). Currently, moonshine production is undergoing yet another shift – a resurgence in popularity and a renewal of legal production in distilleries across the country (Greene 2014; Pierce 2013). In the state of Alabama, illegal moonshine is still very common. Reports of lead poisoning due to moonshine condensed through car radiators were still common in the 1990's (CDC 1992), and the ATF, state, and local police forces are still arresting illegal moonshiners today (Robinson 2016; Taylor 2016).

Anthropology and historical archaeology offer a unique set of methods and theories that are well suited to the archaeological investigation of moonshine production in the state of Alabama. Several historical archaeologists have argued for further research on subversive and alternative economies (Deagan 1988; Gilchrist 2005; Hirth 1996; Leone 1995; Matthews, Leone, and Jordan 2002; Orser 2001, 2010; Roseberry 1988). Kathleen A. Deagan (1988) argued in "Neither History nor Prehistory: The Questions That Count in Historical Archaeology" that certain issues could only be understood through a historical archaeological approach, including "class formation, cultural syncretism, the manifestation of economic inequality among classes,

[and] consumer choice behavior" (Deagan 1988:9). Many historical archaeologists of the early 21st century have argued that capitalism and political economy should be major tenets of historical archaeology, and much research on this topic has focused on colonialism and postcolonial class development (e.g. Gilchrist 2005; Horning 2000, 2002; Matthews, Leone, and Jordan 2002; Orser 2001, 2010; Smith 2008). Recent studies in anthropology and historical archaeology have focused on group identity, voice, agency and practice, political economy, and class distinctions (e.g. Gilchrist 2005; Joyce and Pollard 2010; Leone 1995; Orser 2001, 2010), all of which can be investigated through historical archaeological research on moonshine in Alabama.

Group identity and class distinctions can be determined through combining historical records such as CDC reports, police and arrest records, and historical research with oral histories and informant interviews and archaeological evidence. Group identities – such as race, class, or gender – may become manifest in settlement patterns, still type or layout, production material and methods, or intended consumer base (Blitz 1978; Douglas 2001, 2004; Horning 2000, 2002; Smith 2008). Social class distinctions or racial tensions could also become manifest in this way, particularly moonshine production during and after Prohibition. Historians have argued that one of the major goals of Prohibition in many states was the intent to prevent African-American access to alcohol (Dabney 1974, 1980; Rorabaugh 1979), and anthropological and archaeological investigations of moonshine have demonstrated that informants fairly uniformly assert that the practice of moonshining is either "dying out" or is now the work of professional criminals when the intended consumer base is low economic urban neighborhoods associated with African Americans (Blitz 1978; Peine and Schaft 2012; Pierce 2013).

While it is nearly impossible to determine gender identity associated with the

archaeological remains of moonshine stills (Horning 2002; Pierce 2013), gender roles played a large role in moonshine's importance in the political economy of the southeastern United States. Men were traditionally expected to provide for their families, especially in subsistence-based rural economies (Dabney 1974; Horning 2000; Pierce 2013; Thompson 2011). If that economic support came from illicit moonshine, women and children in rural communities would warn of approaching "Revenuers," and later ATF agents (Dabney 1974, 1980; Horning 2000, 2002; Pierce 2013). Moonshine production after Prohibition tended to move away from a community-based economic pursuit to a more subversive and alternative criminal economy, in which it still plays a major role today (Robinson 2016; Shearer 2011; Taylor 2016). This transition during the 20th century, along with the transition from a legal economic pursuit to a criminal activity during the 19th century, can be seen in both the archaeological and historical records (Blitz 1978; Horning 2000, 2002; Peine and Schaft 2012; Pierce 2013). Focusing on these transitions and group identity can provide a voice for groups that are otherwise marginalized in the historical record due to low socio-economic status, regional stereotypes, and race or gender (Blitz 1978; Deagan 1988; Horning 2000; Gilchrist 2005; Mathews, Leone, and Jordan 2002; Leone 1995; Orser 2001, 2010; Smith 2008).

CHAPTER 4

METHODS

The sample for this project was identified through an ad hoc search of the Alabama State Site File database. The site determination "still" was searched, generating 107 sites previously surveyed in Alabama which were found to contain a still. All 107 sites were used as the population for this project in order to provide as representative a sample as possible. To meet the research objectives of this project, various methods were implemented. The first objective, to discern when in time each site was operating required the analysis of both the still components themselves and artifacts found in association with the site based on the findings of Blitz (1978), Douglas (2002, 2004), and Horning (2000, 2002). For the second objective, to determine whether still types change due to location or time period, I utilized GIS to create maps of still locations based on time period and still type, which allowed the distribution of stills to be determined. The third objective, to interpret the settlement patterns of moonshine production sites in Alabama used Geographic Information Software (GIS) to map the location of all the sites, to perform spatial cluster analysis, and to determine if there were any patterns present such as distance from water, roads, or between stills in the same county. Finally, the fourth objective was to identify and interpret land use patterns associated with still sites and to determine what, if any, adaptations moonshiners made as production became illegal. This required a detailed examination of site reports and pedestrian survey of sites that still remain present in the cultural landscape. The pedestrian survey only occurred if it was determined safe to do so.

This chapter is organized into sections according to objective. The first section describes

the sample of still sites, the criteria created for each still type, and the development of a chronology. The second section explains the GIS procedures used to determine still distribution and the mechanisms for still type changes. The third and fourth sections describe the procedures used to determine settlement and land use patterns associated with still sites and the criteria established for determining if a site was safe to survey. All site reports and location information were compiled from the Alabama State Site File and cultural resource management reports, which were either housed at the University of Alabama Office of Archaeological Research (OAR) in Moundville, Alabama or were received through contact with the authors.

Alabama Moonshine Still Typology and Chronology

Although moonshine stills have been encountered and recorded in cultural resources management (CRM) projects throughout the state of Alabama, an overarching typology and chronology for stills has not yet been established. For this project, the population was made up of 107 moonshine stills recorded in an archaeological context in Alabama. All sites were recorded in the Alabama State Site File. Still layout and terminology vary widely in both the archaeological and historical literature, as well as from state to state. For this project, three still types were identified using the terminology defined by Blitz (1978), as well as terms already present in CRM reports and historical sources. These three types are pot stills (Blitz 1978), groundhog stills (Blitz 1978), and deadman stills (Alexander et al. 2008; Gorecki 2015).

In order to establish a chronology for moonshine stills in Alabama, this investigation had to examine both the criteria for each still type and the artifacts commonly found in association with them. Due to the valuable nature of many of the materials used to create a moonshine still, particularly metals like copper and steel, components of the still, or the entire still itself, may be

taken from a site to be reused after production finished. Therefore, the artifacts found in association with still sites in the archaeological record can be vitally important in determining the date a site would have been used. In this research plan, sites that contained only or mostly historic ceramics would be determined to be older than sites containing glass jars, metal cans, and plastic milk jugs. Certain types of glass jars and containers used during production could provide a more specific date, based on their periods of production, expiration dates, or their time of introduction to consumers. Later stills, typically dating to the middle 20th century, may also present the archaeological remains of harmful additions to speed production. These items could include industrial containers of Purex or other alcohol based chemicals (Alexander et al. 2008) to produce a higher alcohol content in the moonshine, evidence of dead animals in mash barrels, or gasoline and battery powered generators to heat stills without an open flame.[4]

Another factor in dating still sites is the still components themselves. Materials used to make a still, when they remained present, could provide chronological information, such as the introduction of thump kegs during Prohibition, or the use of plastic sheets and piping after World War II.[5] Stills dating to the middle to late 20th century are also more likely to have harmful components that were adapted to moonshine production to make the process faster, such as the use of car radiators as condensers. While all the components may not be present due to reuse or natural deterioration, the types of containers used as mash barrels or boilers can provide some details on time periods – although these objects were often reused or passed down from generation to generation (Horning 2002).

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[4] Animal bones may be used as part of a recipe or wild animals may have found a way into mash barrels during the distillation process (Dabney 1974, 1978; Stewart 2011).

[5] "This container is charged with fresh beer or backings. Vapors from the pot bubble through, giving a second distillation called 'thump likker'" (Dabney 1974). Thump kegs could be made from both wooden barrels and small steel drums. They effectively provide a second distillation of the alcohol made in a still, creating a higher proof product faster. 'Backings' is the term for the first run of alcohol through the still, which is collected for the thump keg or sent through the still a second time.

Four period categories were determined for dating sites: 19th century, early 20th century, Prohibition, and middle 20th century. Stills were sorted into these categories based on still components and associated artifacts. This information was determined based on pedestrian surveys, when it was determined to be a safe area, and data already present in site reports catalogued in the Alabama State Site File. Pedestrian surveys of sites involved utilizing a GPS unit to travel to the site, taking photographs of the site remains, measuring the extent of the site, and determining what type the site was. Dating the site involved research on production periods of artifacts and site materials, and examining land records to determine if the site may have once been located close to historic buildings. If pedestrian survey was not an option, information presented in site reports from previous surveys was used. I used Statistical Package for the Social Sciences (SPSS) to record a data set containing the information for each site.

GIS Analysis of Still Type and Chronology

I used GIS to plot the locations of all 107 sites onto a map. Locations were plotted using the universal transverse Mercator (UTM) coordinates for each site and creating a GIS shapefile. The SPSS table was used as the attribute table for the population and, therefore, all the characteristics recorded for each site were able to be plotted as well, using the "Select by Attribute" feature. A base map of all the locations was created, and different attributes, such as still type and time period, were then selected from the table to sort the locations further. A map for each of the four time periods and each of the four still types was created, eight total, to determine the extent of category spread and to identify possible clusters. This was combined with a frequency analysis, splitting the data by period in order to determine how many stills of each type were dated to each period. If still types were well spread throughout the state and were

present in at least two successive periods, it was assumed that the type evolved over time. If stills were clustered, and only found in a specific place, even in successive time periods, it was assumed that the type was more of a regional preference.

Settlement Pattern Analysis

I used both GIS and SPSS to analyze the settlement patterns of moonshine production in Alabama. Thiessen polygons are polygons generated from a set of sample points; each defines an area of influence around its sample point, so that within the polygon any location is closer to that point than any other point in the sample. They are typically used to estimate centralization in prehistoric settlement patterns (Banning 1978; Christaller 1933; Wheatley and Gillings 2002:149-51) and were used to perform a cluster analysis on all the sites. Thiessen polygons define an area of influence around a set point in relation to all points in the sample – and will be closer together when there are clusters. These were created within GIS, and maps were generated with polygons demonstrating period and still types. Thiessen polygons only consider Euclidean space[6] and, therefore, cannot provide definitive conclusions. They should be used to provide preliminary data for further testing. To address this, I used SPSS to analyze the frequencies of counties in which the sites were found to identify potential clusters. If specific counties had between at least eight and ten sites present, it would be considered a cluster. Other locational data were analyzed as well, including elevation.

I ran a one-sample t-test to compare the mean elevation of the sites to the mean elevation of the state of Alabama, which is 500 feet. The test hypothesis was that the mean elevation of still sites would be higher than the mean elevation for the state, and the null

[6] Within Euclidean geometry, Euclidean distance is the straight line between two points on a plane. Euclidean space encompasses the 2-dimensional plane within Euclidean geometry.

hypothesis was that there would be no difference. If the null hypothesis was rejected, it would mean that the mean elevation of sites was statistically higher than the mean elevation of the state. This would match the geography of the sites, most of which are located in Northern Alabama, and also implies that perhaps higher elevations were specifically sought out.

Land Use Pattern Analysis

Land use patterns were determined and analyzed through pedestrian survey and GIS analyses. During pedestrian surveys of sites vegetation surrounding sites, topography, and proximity to other sites were investigated. Historical research and some oral traditions suggest that vegetation may have been cleared to create a suitable site for moonshine production (Dabney 1974, 1980; Stewart 2011). Downed tree limbs and other uprooted vegetation may have been used to cover sites while moonshiners were not present, in order to further hide it from law enforcement.

Topography would have been very important. Sloped terrain would have naturally flowing springs, which would make carrying or piping water to a still much easier. Higher elevations would have allowed moonshiners greater visibility of anyone approaching their site, which would have enabled them to make a quick escape if they saw a revenuer or ATF agent. Finally, proximity to other stills could demonstrate operation from a single moonshiner or family. If stills were within five miles of each other, it is reasonable to assume they could have been operated by the same person – although steep terrain could mean that this distance was too far to get to in a day. The presence of multiple stills from consecutive periods may also demonstrate the tradition being passed down to later generations.

Camping was another land use factor explored in this project. During a still's operation, it

would have been necessary for a moonshiner to be present at all times – sometimes even foregoing sleep in order to monitor the heat source and still's production (Dabney 1974, 1980; Shearer 2011; Stewart 2011). Many stills in the sample were found in rock shelters, often either directly on top of or next to prehistoric sites, which suggests the areas may have been well known to members of the community. Rock shelters would have provided a water source, cover, and a safe camping location for moonshiners. Others may have chosen to camp directly with their still, or slightly further up a slope in order to have better visibility while not with the still itself. Finally, moonshiners may have chosen to place their stills closer to home, while still being careful enough to establish their sites on publicly owned land to avoid detection, and therefore arrest, and prosecution.

Summary

All 107 still sites recorded in the Alabama State Site File were used as the population for this project. Various methods, including pedestrian survey, SPSS, and GIS analyses were used to meet the research objectives. Establishing a chronology and typology, identifying settlement patterns, and exploring land use patterns for still sites in Alabama were the main project goals. The SPSS output, GIS generated maps, and results of the analyses discussed in this chapter are presented in the next chapter.

CHAPTER 5

RESULTS

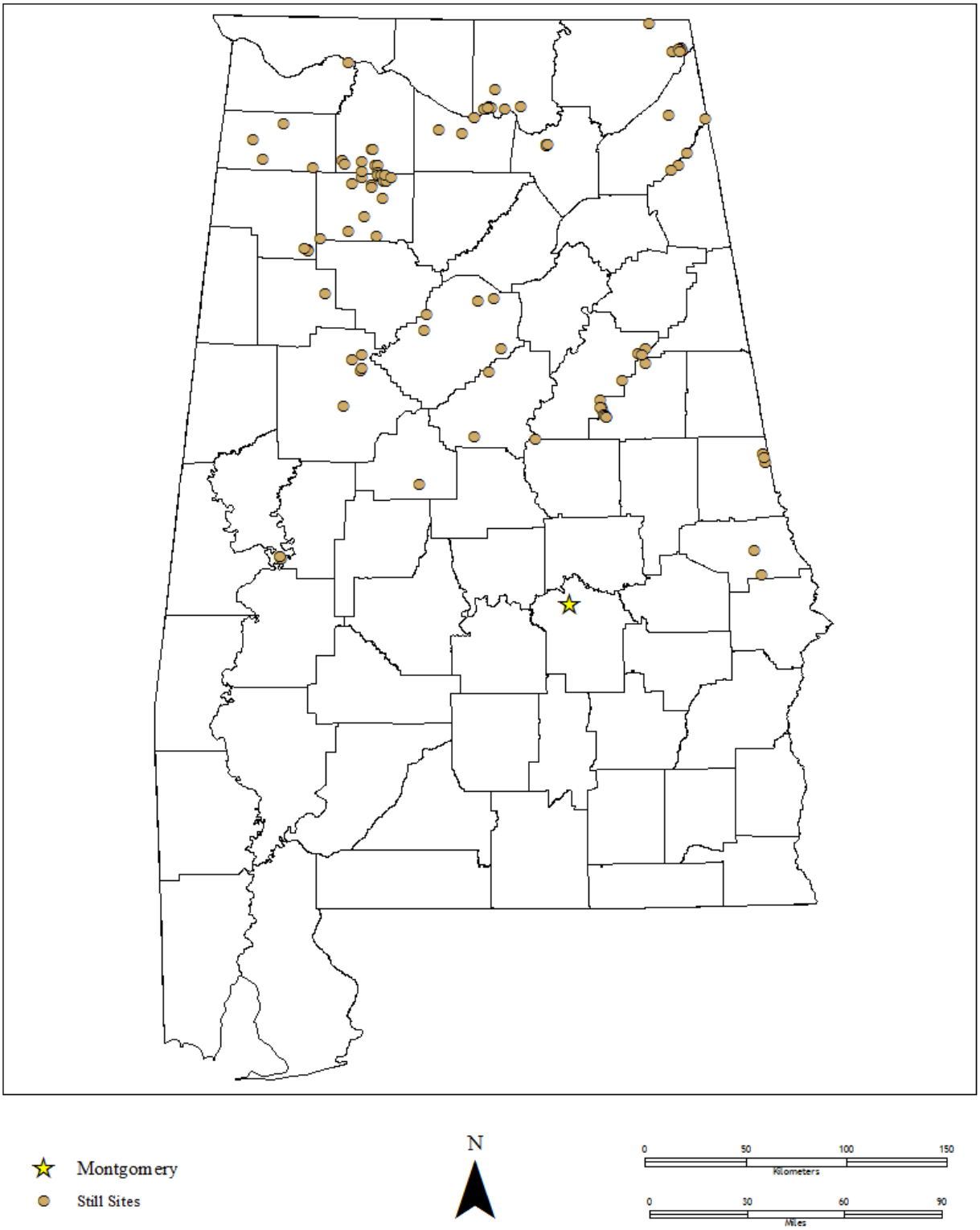
In the previous chapter, my methods for analyzing moonshine still sites in Alabama were explained. In this chapter, I operationalize my research on still typology and chronology, settlement patterns, and land use patterns and present the analyses and results of the methods. This chapter is organized into four main sections according to research objective. The first section addresses the typology and chronology of stills. The second section examines whether types are related more to chronology or to location. The third section presents the analysis of settlement patterns of stills throughout Alabama. Finally, the fourth section presents the analysis of land use patterns surrounding stills in Alabama.

Objective One: Typology and Chronology of Moonshine Stills

I created many of the maps presented in this chapter by first making a basemap of all 107 sites. I did this by plotting all of the Universal Transverse Mercator (UTM) coordinates for each site (recorded in the Alabama State Site File) on a map depicting the counties of Alabama using GIS. Within the shapefile containing all of the site locations, I was able to create an attribute table containing all of the information I recorded for each site – such as site date, still type, site dimensions, or other artifacts present. Through sorting each site based on different attributes I could color code all of the sites or create new shapefiles based on these attributes, which allowed me to create maps presenting only sites dating to a specific period or of a certain still type

(Figure 1).

Figure 1: *Basemap of all 107 Sites used in the Project.*



Typology

Three still types were identified in my research, and one additional site type was added during data analysis. John H. Blitz (1979) identified two commonly occurring still types, pot stills and ground hog stills, found throughout Alabama, which were used in my research. A third still type, dead man stills, was identified through CRM reports. Finally, one storage site was identified in the sample, and will be discussed later in the results. Table 1 presents the total number of each site type found in the sample.

Table 1: *The Still Types with Coordinating Number of Stills.*

Site Type	Number of Sites
Pot Still	51
Ground Hog Still	44
Dead Man Still	9
Storage	1
Undetermined	2
Total	107

Within the sample, I was able to determine that Pot Stills were the most common, followed by Ground Hog Stills, and finally Dead Man Stills (excluding the single Storage Site). Two sites within the sample were unable to be typed due to lack of information in site reports and their removal during investigations of prehistoric material present underneath them.

Figure 2: *Histogram of Still Type.*

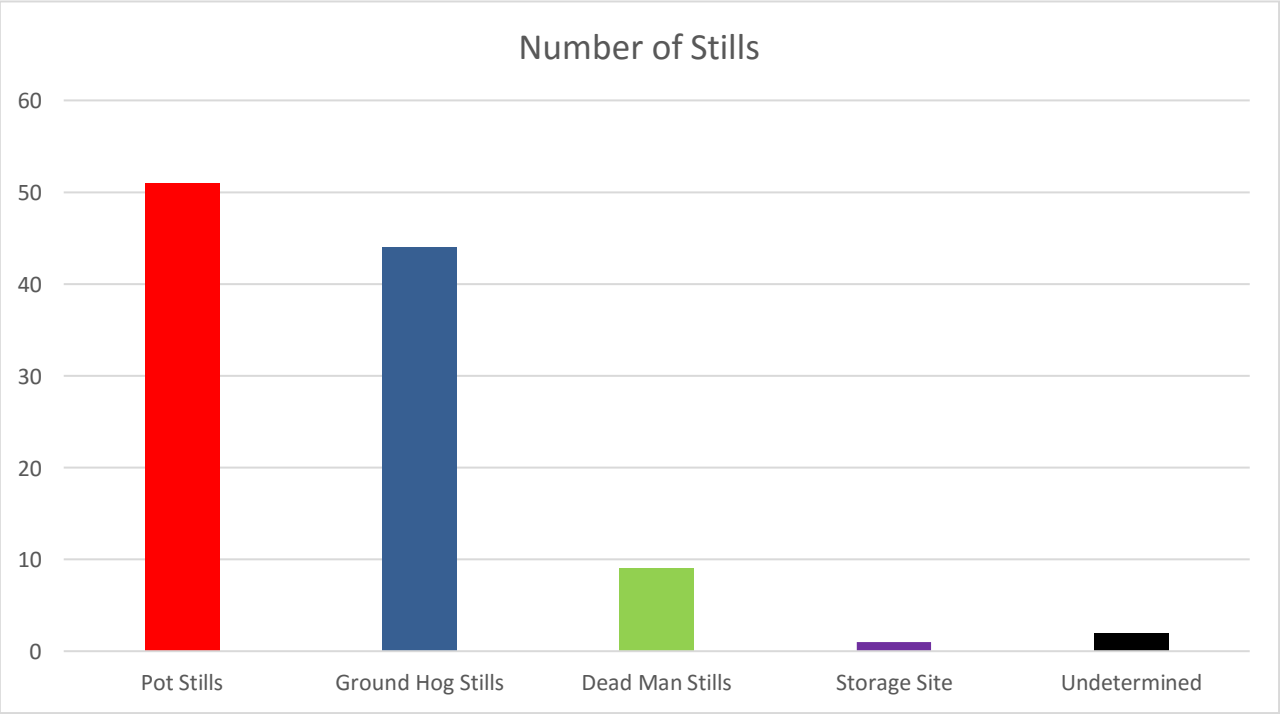


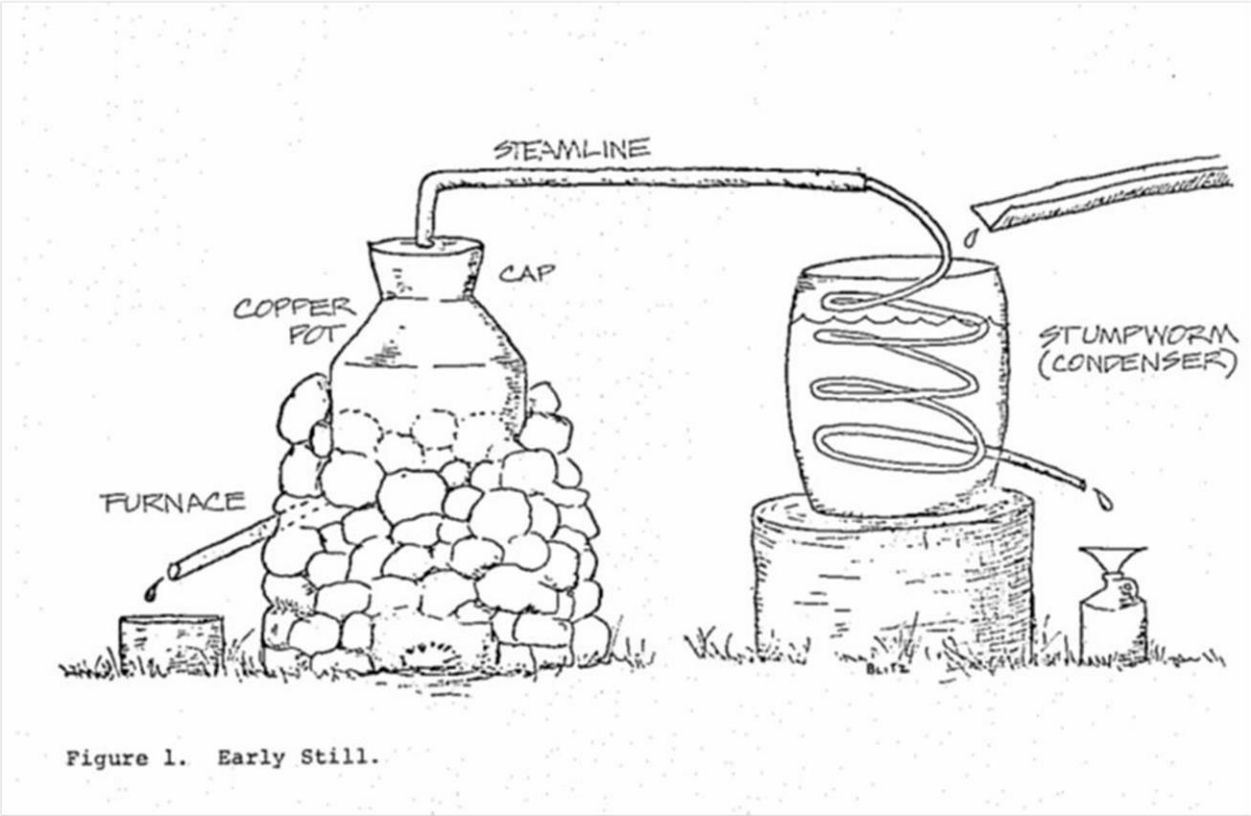
Figure 2, above, presents a histogram of the different still types. The black bar represents the two sites, 1ES162 and 1MN110, that did not have any locational or descriptive information beyond the fact that they were present in the Alabama State Site File and reports listed there. Stills were sorted by type based on several characteristics, including still components, layout, heat source, boiler pot shapes, and size. The descriptions for each still type, and the one storage site, are further organized into subsections. Appendices have been attached to provide line drawings and photographs of each still type.

Pot Stills

Fifty-one pot stills were determined from the population. Pot stills in Alabama were first discussed by Blitz (1979). He produced a line drawing demonstrating the component parts of pot stills (Figure 4). They are characterized by a circular or semi-circular furnace box, typically built

from piled stones or cinderblocks (Figure 3). A single boiler pot is placed on top of the furnace box, although occasionally the furnace box is built up around the sides of the pot. The boiler pot is covered by a copper cap and pipe, which is then attached to a spiral condenser called a worm, typically also made from copper or some other metal. The condenser is housed in a wooden barrel or metal drum filled with cold water, and the end is attached to a smaller straight pipe for dripping. A collection apparatus, sometimes a large basin or several jars, sits bellow the dripper. Mash is boiled in the boiler pot to evaporate the alcohol, the condenser re-condenses the liquids, which then drip into the collection apparatus.

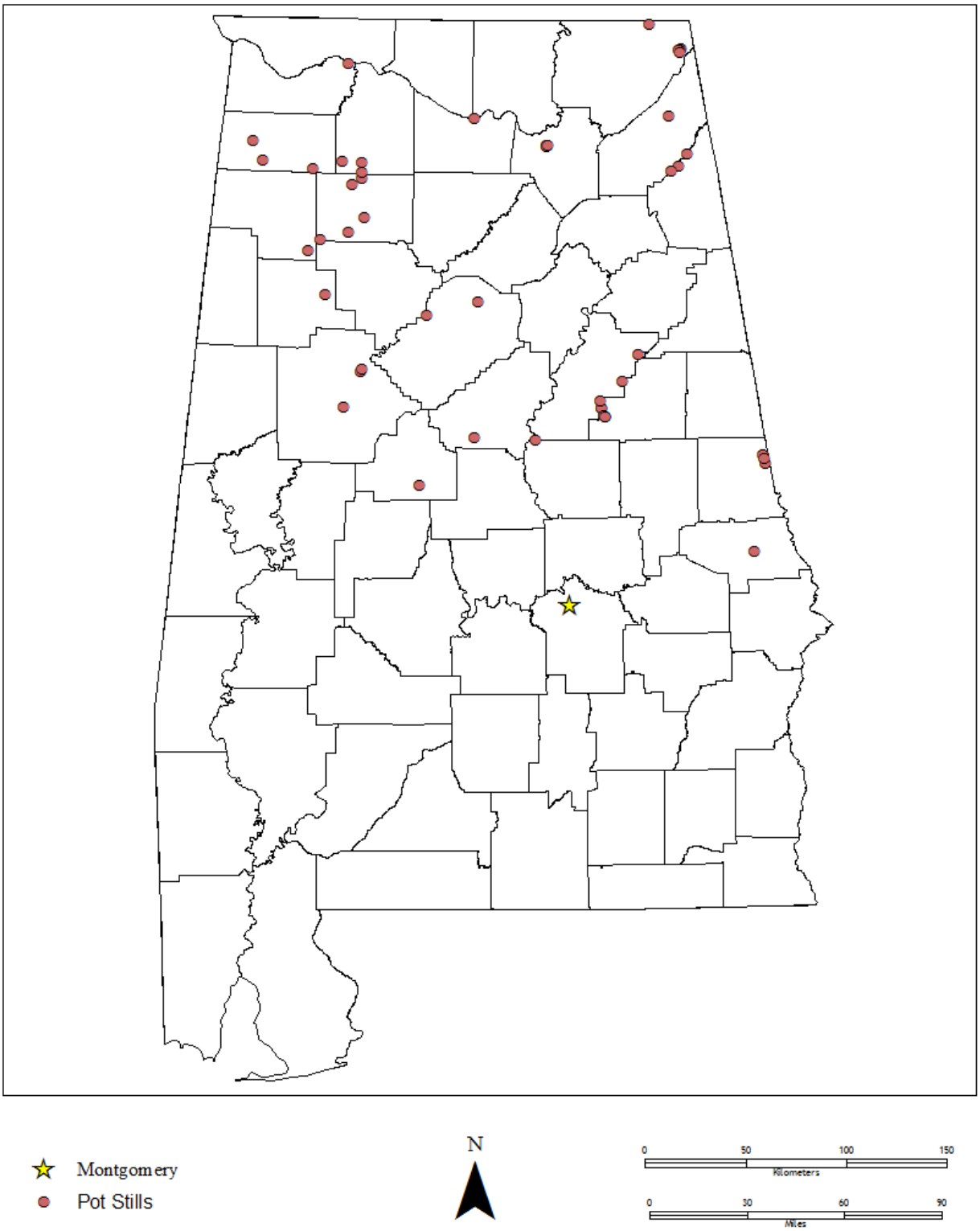
Figure 3: *Line Drawing of Pot Still, Blitz 1979.*



These stills are distributed fairly uniformly throughout central and northern Alabama. In the archaeological record, pot stills can be identified by the stacked stone or brick circular furnace boxes, large boiler pots, and occasionally barrel rings for the condensing barrel. They are

commonly surrounded with lead or copper piping, large broken jars or crockery, and minimal disturbance to the surrounding environment. Pot stills in Alabama are often found in or near rock shelters, directly beside their water source. Figure 4 depicts the geographic distribution of pot stills across Alabama.

Figure 4: *Map of Pot Stills in Alabama.*



During the field work phase of this project, I was able to photograph a more modern pot still near Tupelo, Mississippi. This site contained batteries, plastic tubes, rusted metal pipes, and metal drums. More recently, it appears to have been used as a location for partying in the woods, based on the other items present (Figures 5.1-5.3).

Figure 5.1: *A Modern Pot Still Site, Tupelo, MS.* This photograph was taken by Cassandra Medeiros in March 2016. A "busted" metal barrel with a drilled hole, most likely used to connect pipes to the barrel, and an axe mark in the side. There are also several metal pipes possibly used in the still along with modern trash.

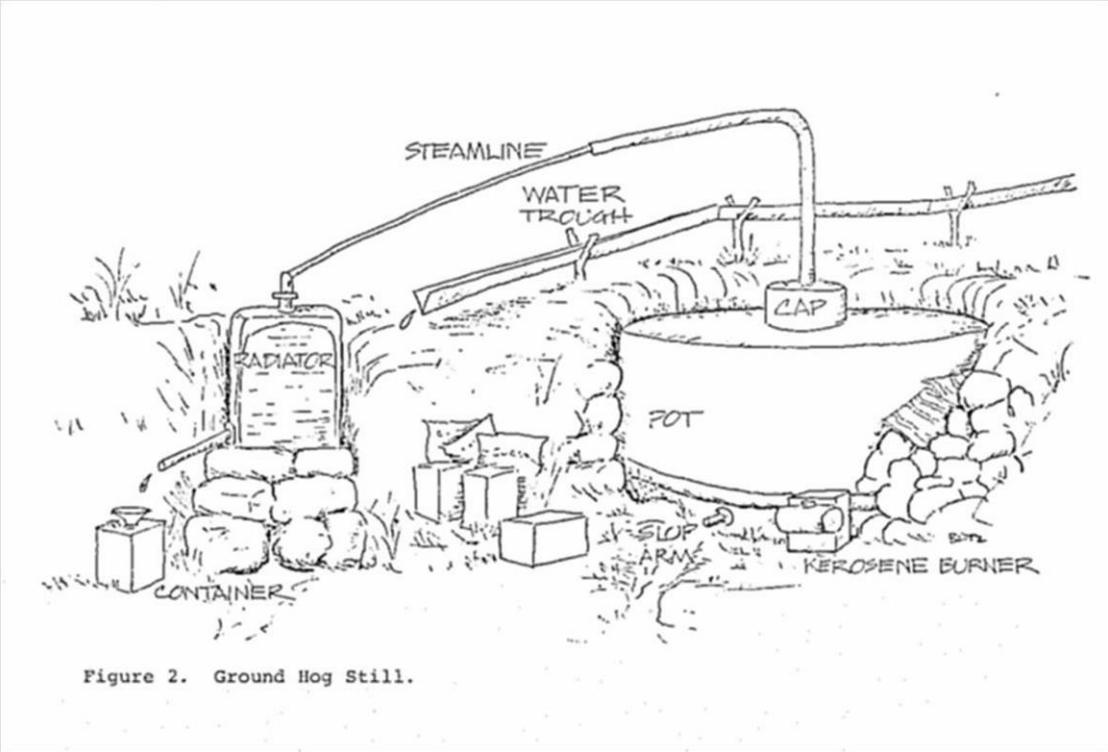
Figure 5.2: *Artifacts Associated with Tupelo Still Site.*The batteries present in the photograph below were probably used to power a generator for the still's heat source. Plastic hoses and metal piping were likely part of the still. Large plastic containers, including chemical containers, may have either held ingredients or used to collect the final product.

Figure 5.3: *Further Artifacts Associated with Tupelo Still Site.* Metal pipes and barrels, plastic buckets, and plastic jugs are indicators of moonshine stills dating from the middle 20th Century to today.

Ground Hog Stills

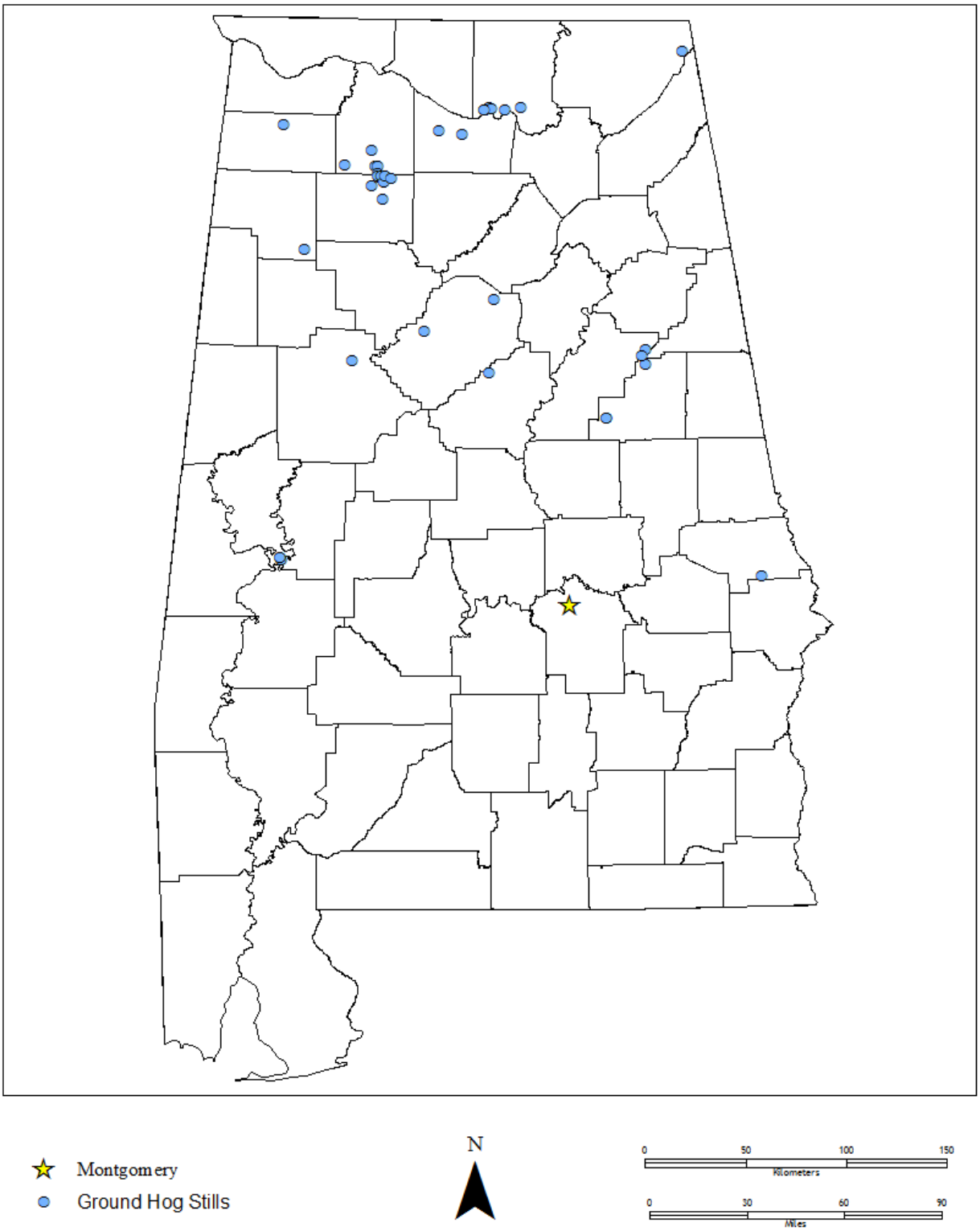
Forty-four ground hog stills were found in the sample, making this category the second most common. Ground hog stills in Alabama were first discussed by Blitz (1979). He produced a line drawing demonstrating the component parts of ground hog stills, which is presented below as Figure 6. They are characterized by a partially buried heat source and boiler pot. The heat source is usually kerosene or gasoline powered to prevent smoke and lower the risk of detection. The boiler pot is typically shorter and wider than other still types, but is still covered with a copper cap and piping. The condenser is fairly similar to pot stills, although sometimes instead of a worm condenser in a container of cold water an old car radiator is used. Artifacts commonly associated with ground hog stills include Mason jars, broken glass, metal or plastic tubing and piping, gasoline or other fuel containers, and chemical containers. Ground hog stills may often include several mash barrels for consecutive production cycles, or multiple furnace barrel setups.

Figure 6: *Line Drawing of a Ground Hog Still, Blitz 1979.*



Ground hog stills are distributed fairly uniformly across central and northern Alabama. In the archaeological record, ground hog stills are most commonly identified by circular or key-hole shaped depressions next to small and often seasonal streams. Unlike pot stills, ground hog stills are typically found out in the open, rather than in rock shelters. Certain measures may be taken to disguise or hide the still – including covering it with tarps or loose vegetation from the surrounding area. Burying the still halfway or entirely also prevents detection from law enforcement agents. Figure 7, below, depicts the geographic distribution of ground hog stills across Alabama.

Figure 7: *Map of Ground Hog Stills in Alabama.*



Ground hog stills appear to be more concentrated and clustered than the distribution of pot stills (Figure 3).

During the fieldwork for this project, I was able to investigate the remains of a ground hog still in Tuscaloosa County, Alabama. This site contains a half-buried steel barrel, rusted metal pipes, and a metal wash basin that was most likely used for moonshine collection at the base of the still. It was built directly in and next to a seasonal stream bed, and most likely dates to the 1940's. The photograph of the site is presented below as Figure 8.

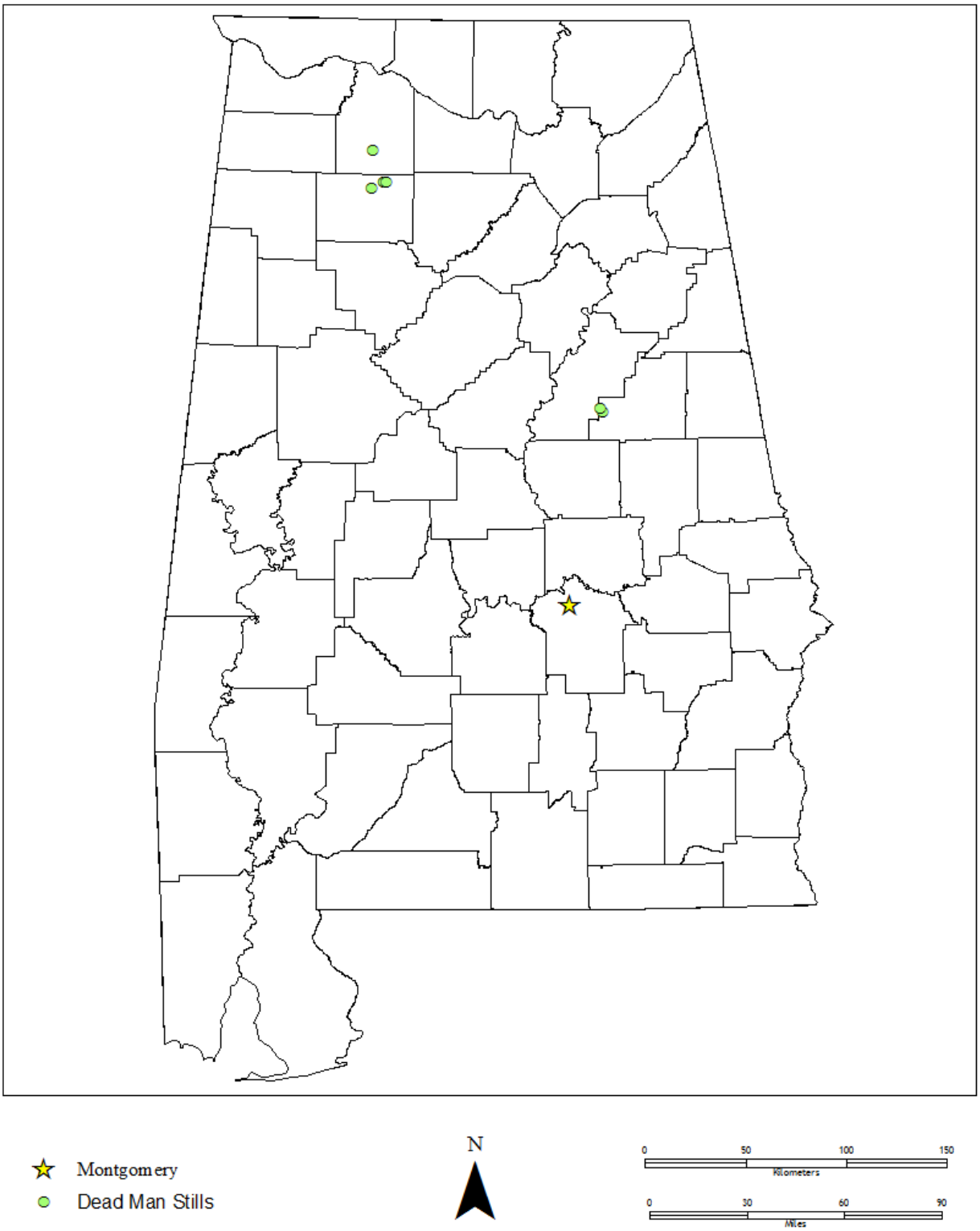
Figure 8: *Photograph of Ground Hog Still.* A ground hog still operated during the 1930's and 1940's, found in Tuscaloosa, Alabama. The still is surrounded by several young trees, including one growing through the barrel. Several metal pipes are present along the creek bed running to and from the still. The still also presents an axe chop and shotgun pellet holes throughout the barrel itself, and the cap has been removed. An old metal bucket was likely used for collection of the final product.

Dead Man Stills

Nine dead man stills were found in the sample, making this category the least common found in the sample. They were discussed by Rosalie T. Gorecki (2015) and Alexander et al. (2008) in cultural resources management reports. Figure 9, below, depicts the geographic distribution of dead man stills in Alabama. They are characterized by long, rectangular furnace boxes typically made from metal sheeting or cinderblocks. This square box gives the still type its name, because these stills resemble a dead person lying in a coffin. The pot is made to be long and laid on its side, with pipes for evaporation attached to the middle of the still, with or without a cap. Dead man stills are usually made with steel drums and metal or plastic piping. They are typically covered in several tarps to prevent detection, although a few have been found in Alabama with stone furnace boxes, similar to pot stills. Piping from the still pot is usually connected to a small condensing barrel, either wooden with iron rings or a small steel drum, and the final product is collected in glass jars, plastic jugs, or large containers for quick transport and later distribution.

Dead man stills are highly concentrated between two counties in northern Alabama – Lawrence and Winston (Figure 9). Two sites are located outside this cluster in Clay County, Alabama, near the Georgia border. Dead man stills are commonly discovered in association with large industrial containers of sugar or other chemicals, plastic collection containers and piping, and tarps. They are located in drainage ditches and rock shelters in order to avoid detection.

Figure 9: *Map of Dead Man Stills in Alabama.*



During the field work for this project, I was able to investigate a site in Tuscaloosa County that appears to be the dump site of a dead man still (Figures 10.1-10.2). This site contains a large steel barrel with piping attached and the remains of an older model refrigerator. This site appears to date to the middle or late 20th century, based on the PVC pipes attached to the steel barrel. I argue that it is a dump site for the still because there are no other pipes or artifacts in the vicinity other than pieces of the operating mechanism of the refrigerator, even though this site is located along a seasonal creek bed.

Figure 10.1: *A Middle 20th-Century Dead Man Still, Tuscaloosa County, Alabama.* The barrel of the still with plastic pipe attached. There is also a refrigerator part to the left of the barrel.

Figure 10.2: *The Dead Man Still Barrel and an Old Refrigerator.* The still is surrounded by several very young trees, including a few growing through the refrigerator and directly next to the barrel. No metal or plastic pipes other than the one attached to the barrel itself were found at the site, and there was no evidence of plastic containers, glass jars, or historic ceramics.

Storage Site

One storage site was identified in the sample, MA1437 (Figure 11). It is located on Redstone Arsenal in Madison County, Alabama (Alexander and Smith 2007; Alexander et al 2008). The site contains evidence of at least nine steel drum mash barrels, several depressions where more may have been placed, iron barrel rings, and a cement landing directly on the creek bank. Another cement landing is located across the creek, somewhat down river from the landing at site MA1437, possibly for distribution of finished products.

Figure 11: *Map of Storage Site.*

Chronology

Four periods were created to establish a chronology for moonshine stills in Alabama: the 19th century, the early 20th century, Prohibition Era, and the middle 20th century (Table 2). The date ranges for each of these periods will be broken down separately, as each one is discussed below. Stills were dated based on location (i.e. association with buildings on census maps, distance from settlements and roads), materials used in the manufacture of the still, and artifacts associated with the still.

Table 2: *Period Categories with Coordinating Number of Stills.*

Time Period	Number of Stills
19th Century	5
Early 20th Century	32
Prohibition Era	36
Middle 20th Century	32
Undetermined	2

Dating stills within each of these categories involved examining the materials used to create the component parts of the stills themselves and the artifacts found in association with the site. Each category will be discussed separately.

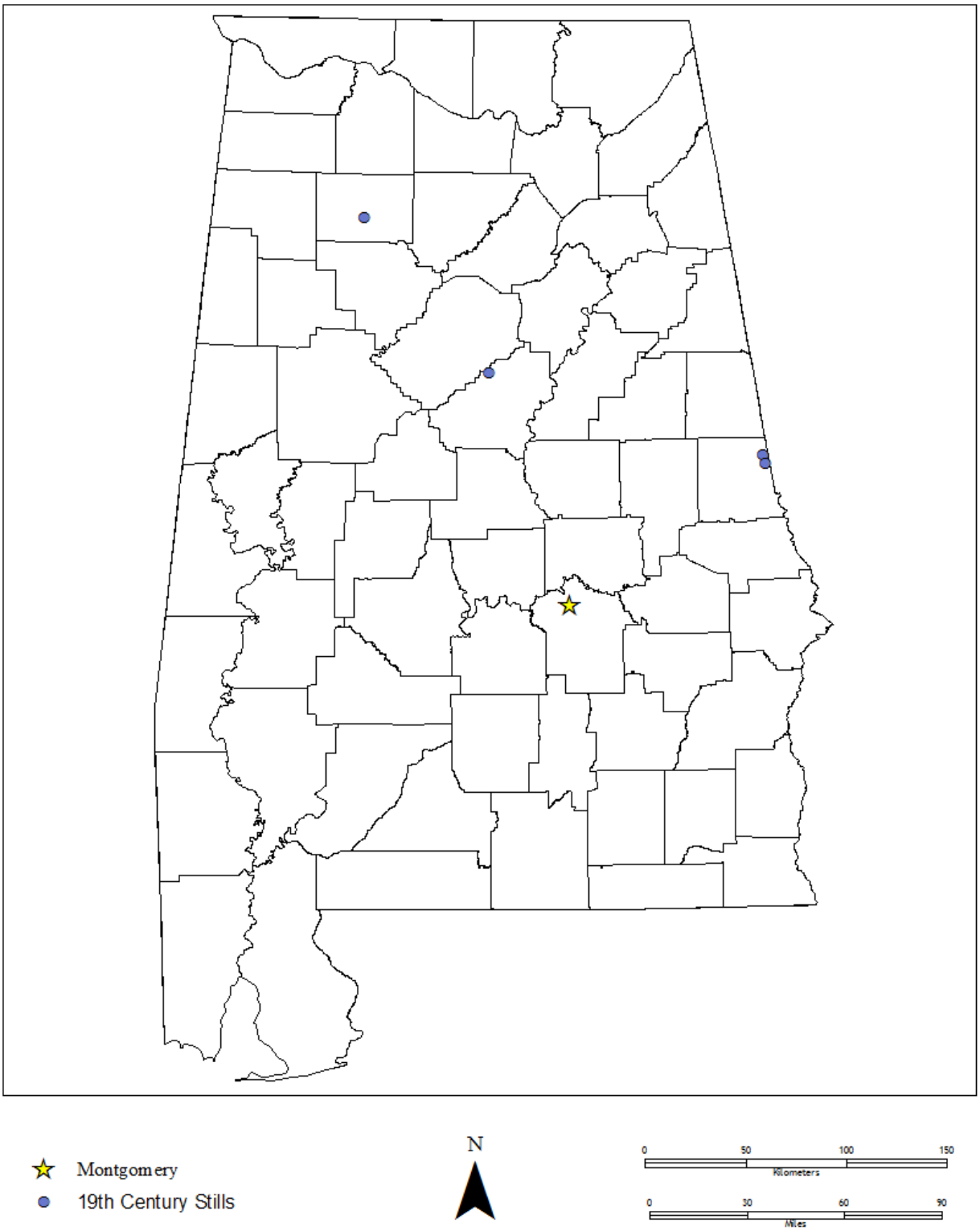
19th Century

In dating 19th-century stills, I utilized many different resources, one of which was the 1890 census map that records buildings in different areas. Stills located near the remains of historical structures recorded in the 1890 census map may in fact be of the same context as the historical structures. Other factors that I used to date stills included the materials used to make them. Copper pots, caps, and piping were used for distilling purposes since the 17th century (Meacham 2009; Smith 2005), and are most likely the oldest materials used in Alabama as well.

Rather than steel drums for condensers, or later for thump kegs, wooden barrels with iron straps were most likely used, and in the archaeological record the straps would be the only thing preserved. Early stills are also found with crockery rather than glass. Large ceramic containers, usually jugs, would have been used to collect the final product, and then store it. For larger production runs, wooden barrels would have been used for collection as well. Furnace boxes would have been made out of available materials, most typically out of stacked river stones rather than finished materials like cinderblocks, which were employed later.

Sites dating to the 19th century are the smallest category in the sample, five out of the entire population. This is most likely due to lack of preservation and the common occurrence of reuse within moonshining, both of still components and site locations. Much of the evidence of older stills may be lost due to continued use of the site, or because valuable still components, especially copper pots and piping, would be looted from an abandoned site and used in a new still. Geographically, 19th-century stills are spread widely across the center of the state, with no large clusters evident (Figure 12).

Figure 12: *Map of 19th-Century Sites.*



Three of these sites, located in Chambers County, were recorded along the Chattahoochee River. The other two sites, one each in Winston Shelby counties, are not located along any major rivers, but rather are most likely located along tributaries and seasonal streams.

Early 20th Century

The early-20th century period dates from around 1900 to 1915, when state-wide prohibition laws were passed. Many counties had passed their own dry laws, and it is at this time that moonshine production begins to become entirely illegal, rather than legal for registered distillers (Dabney 1974: 76). Stills begin to be placed in more remote areas, particularly in rock shelters with running creeks or collection pools. Pots, caps, and piping are still made from copper, with wooden barrel condensers, leaving copper pipes and iron straps in the archaeological record. Furnace boxes are still typically made from river stones, but bricks are starting to be used as well. Bricks are more common at still sites located closer to seasonal and remote streams, rather than larger waterways. Moonshine at this point is beginning to be sold to individuals rather than being produced for personal use or transport to a market or general store as a commodity. This may explain a shift in artifacts found in association with stills dating to this period. Rather than crockery or multiple wooden barrels, glass jars and pieces of broken glass are more common. Stills remain small operations during this period, typically with only one furnace box per site.

Thirty-two of the stills in the sample were able to be dated to this period and are spread throughout northern and central Alabama (Figure 13. The first evidence of clustering of sites also appears during this period, possibly due to the rising illegal nature of production, the involvement of families or communities in production, or the availability of fresh water sources

and remote locations. Early 20th-century stills are present in the same areas as 19th-century stills, suggesting a continuity of practice in these locations.

Figure 13: *Map of Early 20th-Century Sites.*

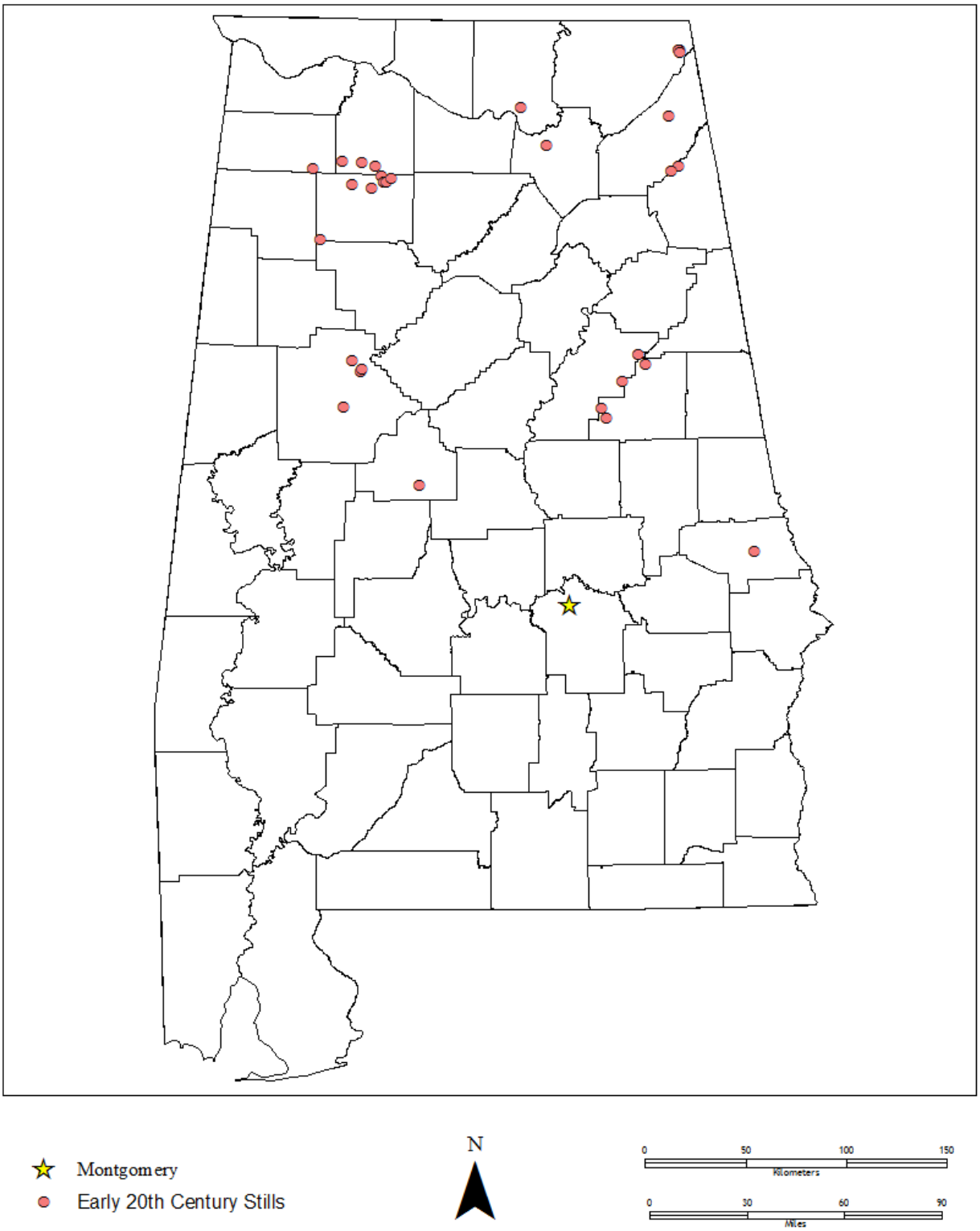


Figure 13 depicts two large clusters of 20th-century sites, one on the border between Lawrence and Winston counties and the other on the border between Clay and Talladega counties. The remaining sites seem to appear close to major rivers, with sites in Tuscaloosa County following the Black Warrior River and sites in Madison, Marshall, Jackson, and Dekalb counties following the Tennessee River.

Prohibition Era

The Prohibition Era period dates from 1915-1933, when prohibition laws were in effect in Alabama and nationally. Moonshine is at the most illegal and most profitable point in production history, and the introduction of organized crime during this period (Bondurant 2008; Dabney 1980) increased production substantially. During this period, still sites exhibit multiple furnace boxes, condensers, and the invention of the thump keg, which was used to double the proof of the produced alcohol effectively without running it through the still a second time. Originally, thump kegs were made from wooden barrels, but later they were made from small steel drums. Steel begins to be used for still pots and condensers during this time, as well as car radiators as condensers. Copper was primarily used to make a still cap. It was very expensive during this time, and its purchase was tracked by authorities attempting to shut down the moonshine trade, as were sugar purchases. Steel and lead piping became the norm instead of copper pipe. Glass jars were the primary method of collection, and occasionally crates to hold the jars can be found in the archaeological record along with broken glass or whole jars.

Prohibition Era stills are located primarily in northern Alabama, and sites appear to be very clustered (Figure 14). These clusters appear in similar areas to those of the early 20th-century period, suggesting further continuity of practice into this period. Mountainous terrain in

northern Alabama may have provided better cover and hard to access sites, preventing detection or destruction of sites from local authorities. These locations may have also made transportation of moonshine out of the state easier, whether through river or car transport. Thirty-six stills from the sample dated to the Prohibition Era, making it the largest category, although not by a large margin.

Figure 14: *Map of Prohibition Period Sites.*

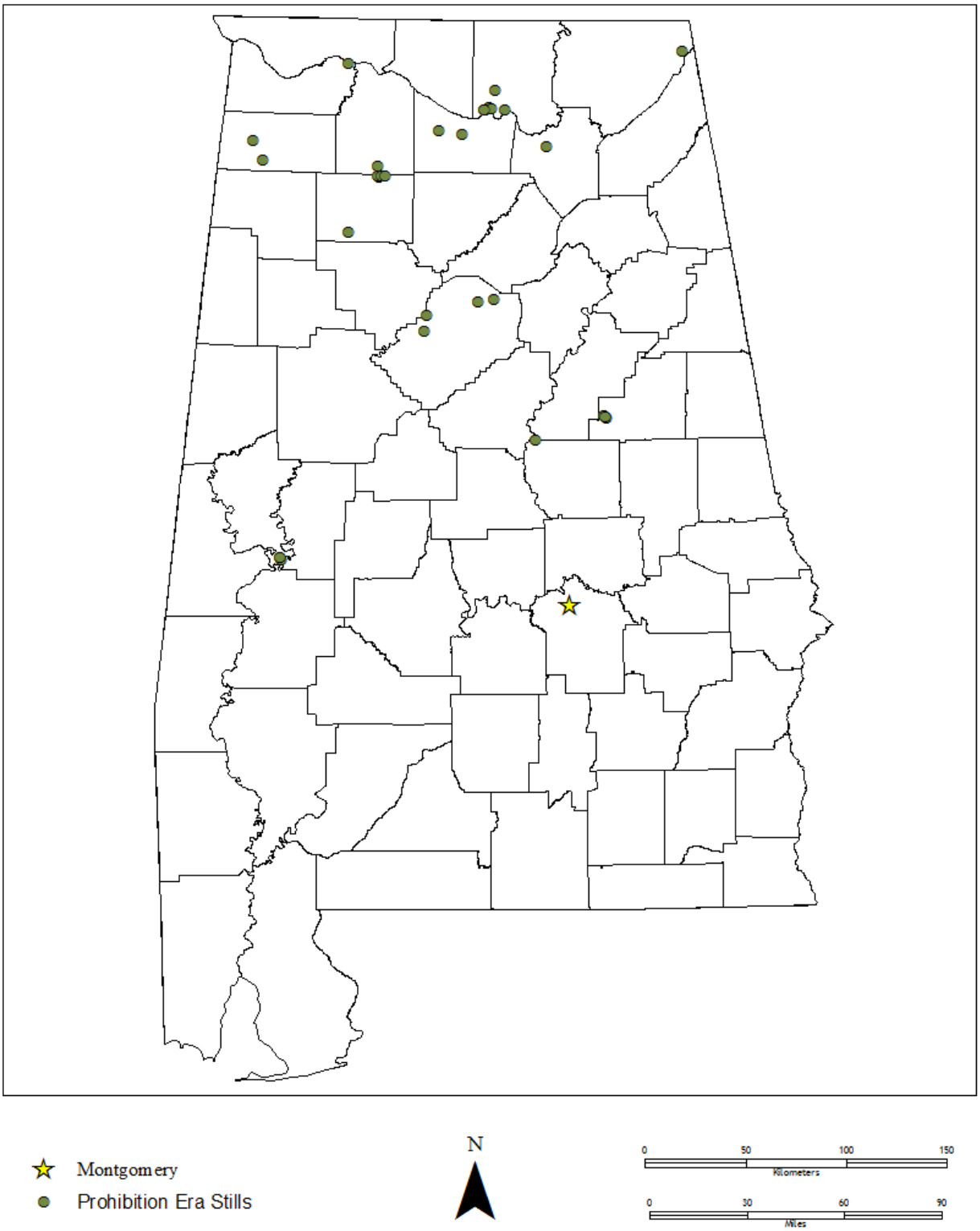


Figure 14 demonstrates that sites dating to the Prohibition Era are clustered along the major river systems in Alabama. The majority of sites are located along the Tennessee River, but sites are also commonly found along the Coosa and Black Warrior rivers.

Middle 20th Century

The middle 20th-century period dates from the 1930s to the early 1960s. During this period, hot rods, the Bureau of Alcohol, Tobacco, and Firearms (ATF), and the use of chemicals in production all become major factors in moonshining. It is during this period that "bootlegging" and "blockading" become popular terms for moonshiners, the latter term linking them to the blockade runners of the Confederacy (Dabney 1974: 77-80; Miller 1989: 199). Innovations to car engines became a necessity to outrun ATF or local law enforcement agents hot on the trail of moonshine transporters, and would eventually lead to the foundation of NASCAR (Poole 2002). Stills during this period are made of corrugated steel drums, steel and lead pipes, PVC piping, tarps, plastic hoses, and battery operated generators. Containers of chemicals used to raise the alcohol content of the final product artificially are commonly found in association with later stills, as well as plastic jugs used for collection.

Middle 20th-century stills are often found in highly remote areas. Typically, they are placed in thickly wooded areas with high underbrush very close to their water source. Water sources are usually small seasonal streams, although larger creeks and rivers may be used as well. Underbrush and small trees cleared for the production area may be used to cover the still. Tarps are also commonly used to hide stills. Moonshine during this period was not as economically viable as it was during the Prohibition Era, and in many places bonded liquor from state sponsored stores could be purchased more cheaply (Dabney 1974: 53-78; Pierce 2013: 50-

72). Moonshine had become a fully functioning criminal operation at this point, and the criminal networks started during this period would eventually lead to networks that produced marijuana in the 1970s and 1980s, and methamphetamines in the 1990s and early 2000s.

Figure 15: *Map of Middle 20th-Century Sites.*

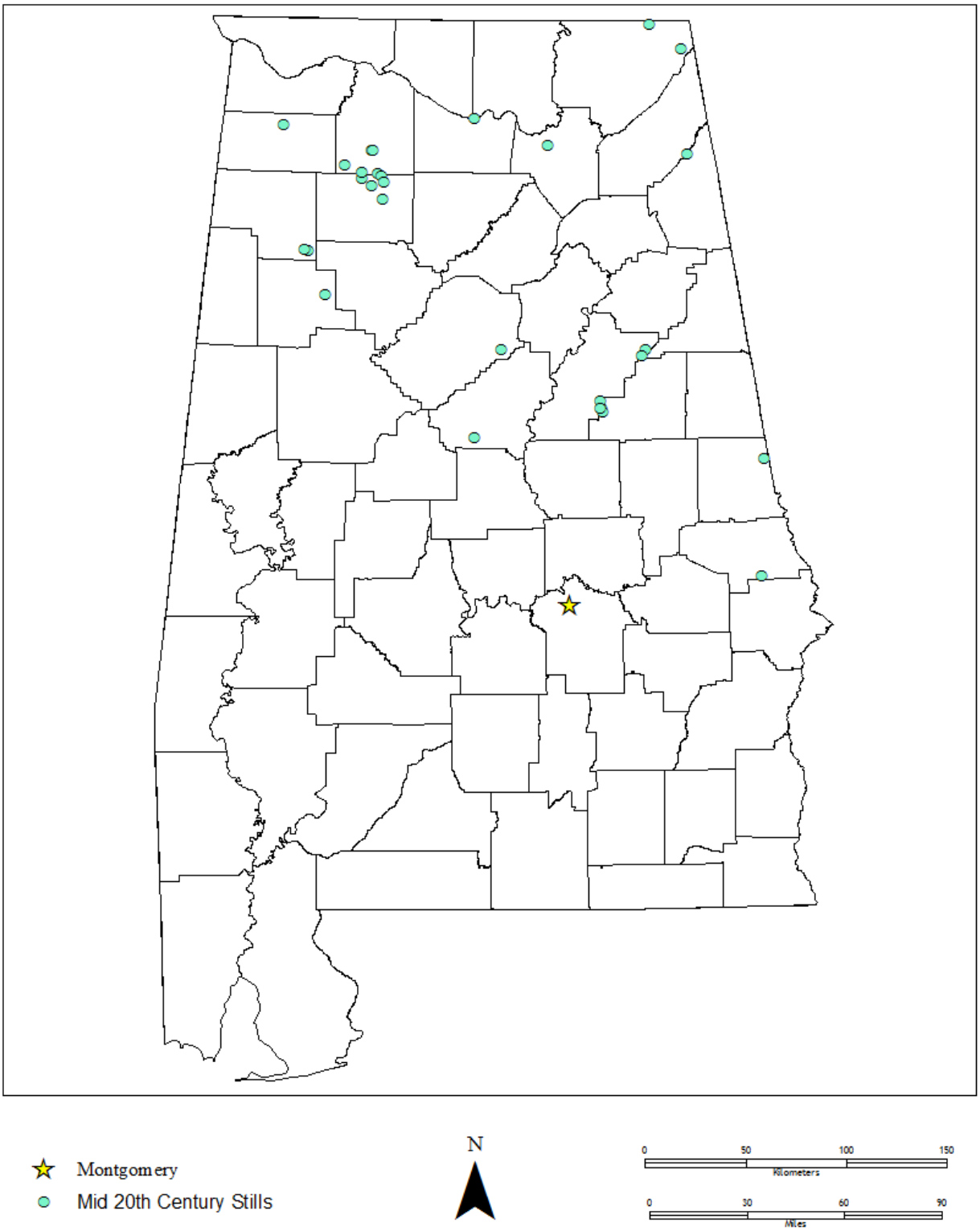


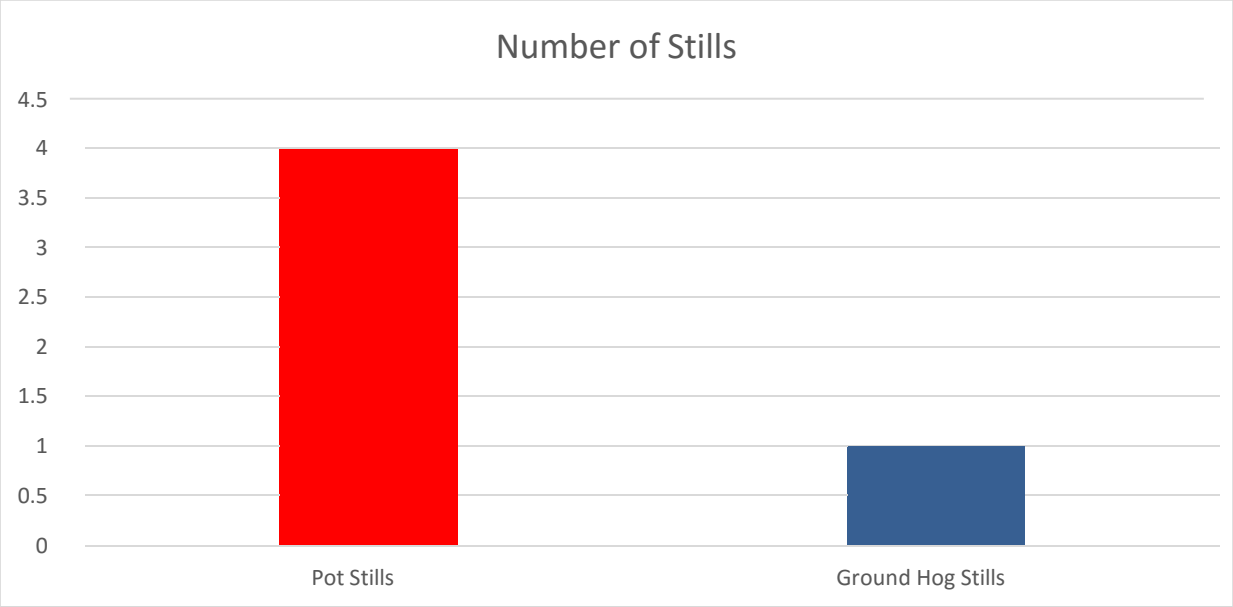
Figure 15 demonstrates a large cluster of sites, again along the border between Lawrence and Winston counties. The remaining sites are located near the Black Warrior, Coosa, Chattahoochee, and Tennessee rivers.

Objective 2: Typology Changes

The second objective of this project was to determine why types changed, whether due to technical advancements over time or regional preferences. To test this, I used SPSS to group artificially the data by time period and examine the frequencies of still types for each period. Additionally, I used GIS to map and designate different still types in order to determine if they only occurred in a particular area of Alabama or were scattered fairly equally throughout the state. The results of both of these tests were combined to determine whether a type change occurred gradually over time or singularly in only one area.

First, I looked at the SPSS output reports for the frequencies of still type in each period category. Figure 16 presents the frequencies of still type for stills.

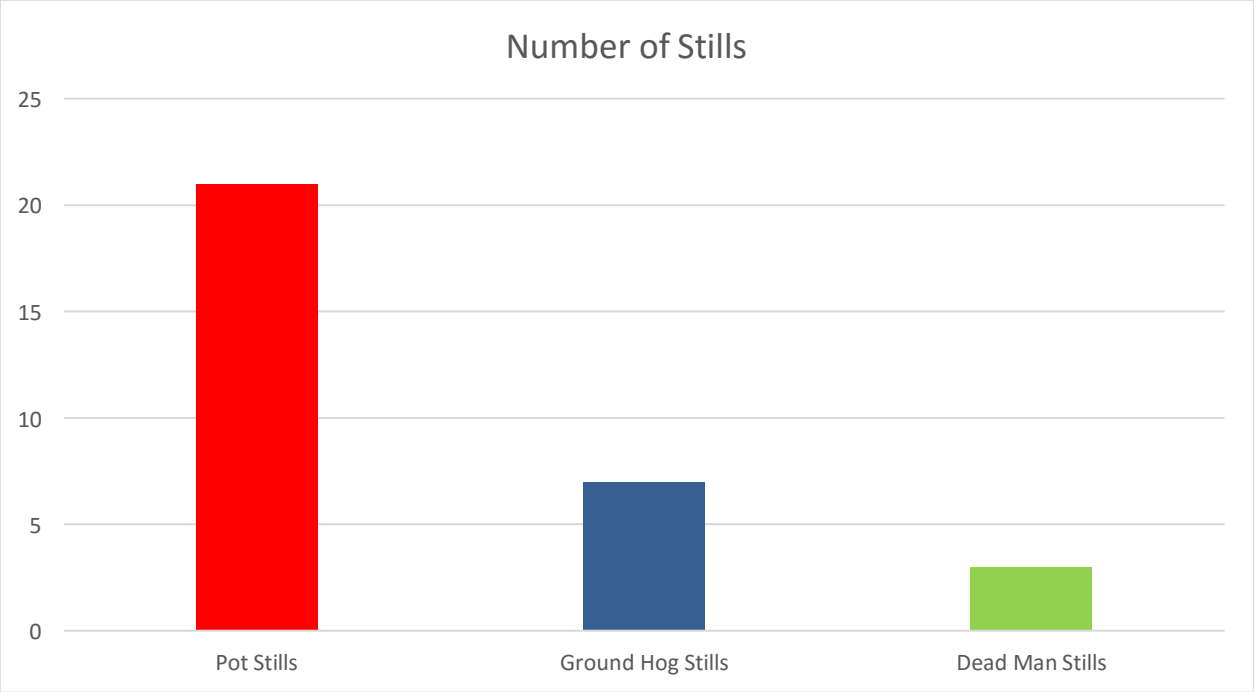
Figure 16: *19th-century Moonshine Still Types.*



Of the five 19th-century stills, four were pot stills and one was a ground hog still. This ratio loosely suggests that pot stills were more popular, and possibly older. During interviews with former moonshiners, Blitz (1979) determined that pot stills were the oldest still type they knew of, which seems to be backed up by the archaeological evidence. The large spread of stills across central Alabama during the 19th century (see Figure 12) also suggests that rather than a single area, pot stills are more widely used during this period than ground hog stills.

The early 20th century period had a much larger number of stills, but a similar ratio of pot stills to ground hog stills existed (Figure 17).

Figure 17: *Early 20th-Century Moonshine Still Types.*

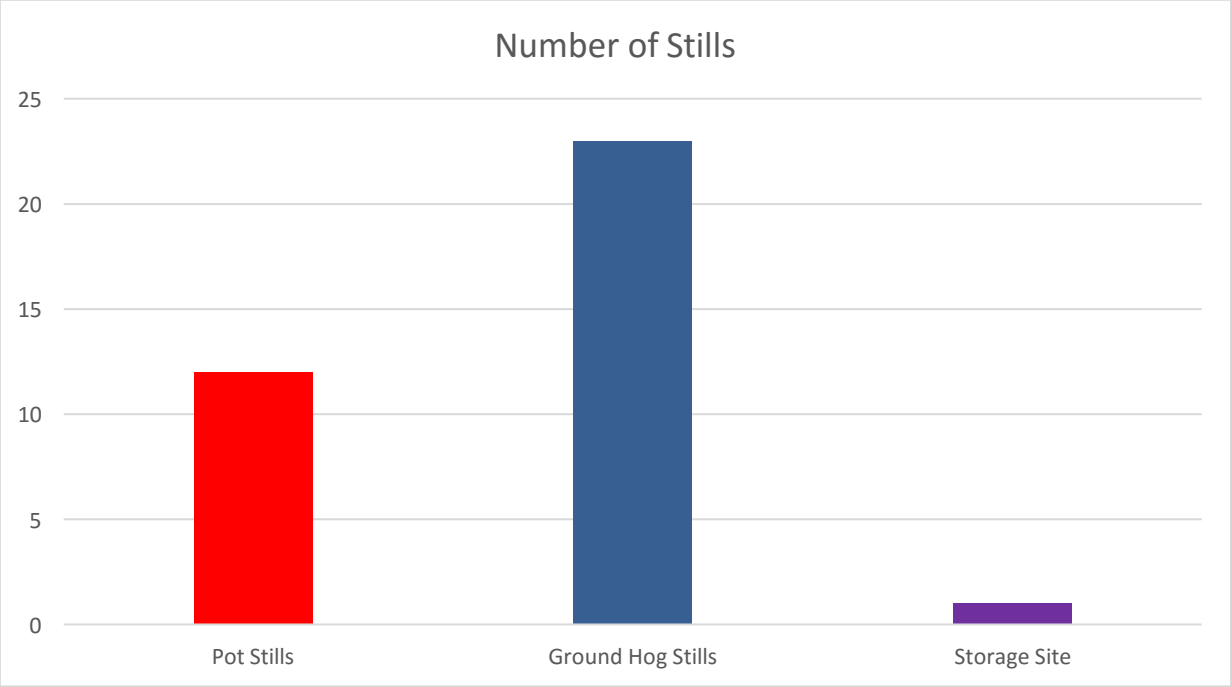


The early 20th century period also sees the introduction of dead man stills. Two stills of this type are located in Clay County, and are within 10 miles of each other. The other still types found in this period are present in more than one county, and are found in consecutive time periods. While there are many more pot stills than ground hog stills found during this period, the ratio of about

4:1 remains the same. Both the pot stills and the ground hog stills from this period are widely spread throughout the state, suggesting that perhaps dead man stills originate as a local development during this time.

The Prohibition Era presents some drastic differences: there are no dead man stills found in the sample dating to this period, and ground hog stills were more popular than pot stills. This period also exhibits the one storage site found in the sample.

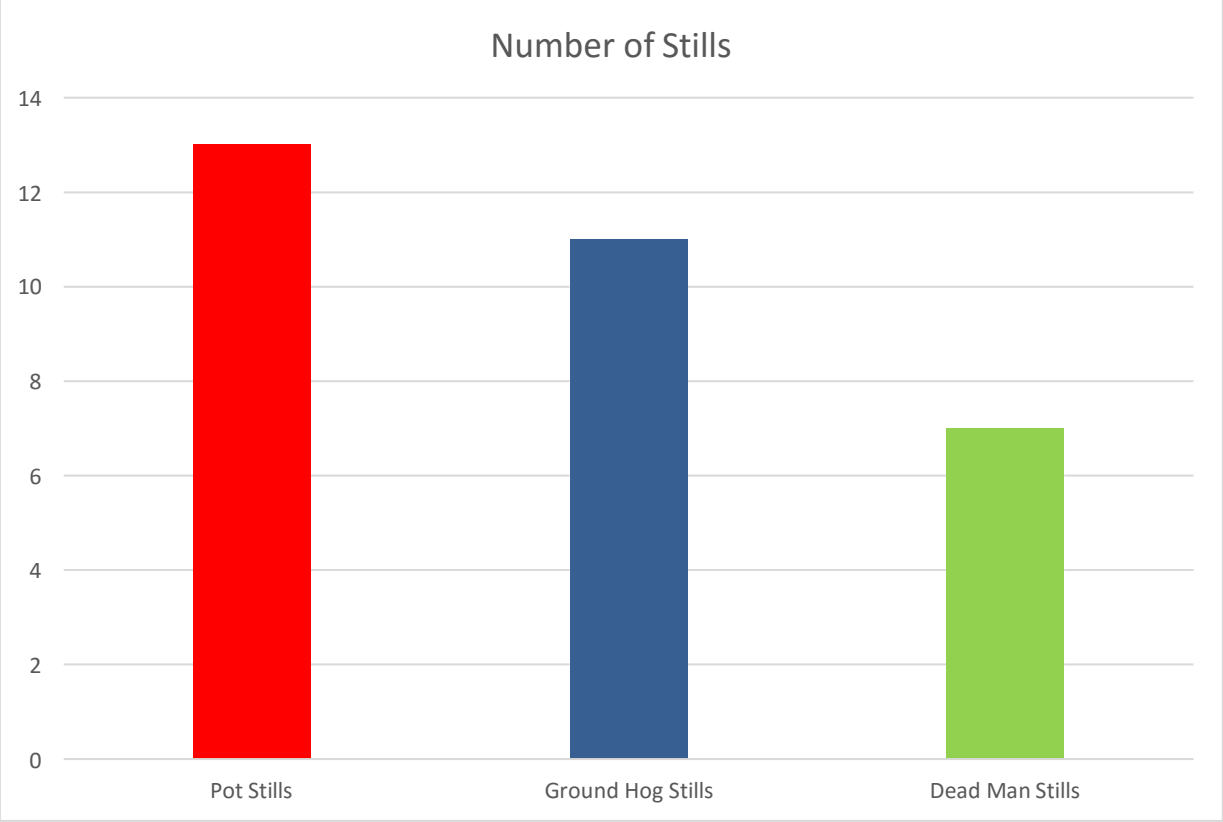
Figure 18: *Prohibition Period Moonshine Still Types.*



Ground hog stills become the most common type during this period – most likely due to their ability to be hidden more easily than pot stills, an idea which moonshiners presented in interviews with Blitz (1979). Pot stills remain present and spread throughout the state, so their continued use is not subject to a specific region. The single storage site, MA1437, is located in Madison County. The Prohibition period is when moonshine was at its highest point of economic viability, and the presence of a storage and distribution site suggests a fairly widespread distribution network potentially reaching more northern states.

Finally, dead man stills reappear in the middle 20th century; again very clustered, but in a different area of the state (see Figure 8). There are also more of them than during the early 20th-century period. Pot stills are once again the more popular type during this period, but there are not many more than ground hog stills. Figure 19 presents the frequencies of still type during the middle 20th-century period.

Figure 19: *Middle 20th-Century Still Types.*



All seven dead man stills present during this period are located near the border between Lawrence and Winston counties. The pot still to ground hog still frequencies are very close, and both types are spread widely across Alabama. During this period, stills would need to be extremely well hidden (possibly explaining the reappearance of dead man stills) or easy to set up, break down, or get away from, which possibly explains the more common occurrence of pot stills as they are the least complicated setup of the three types.

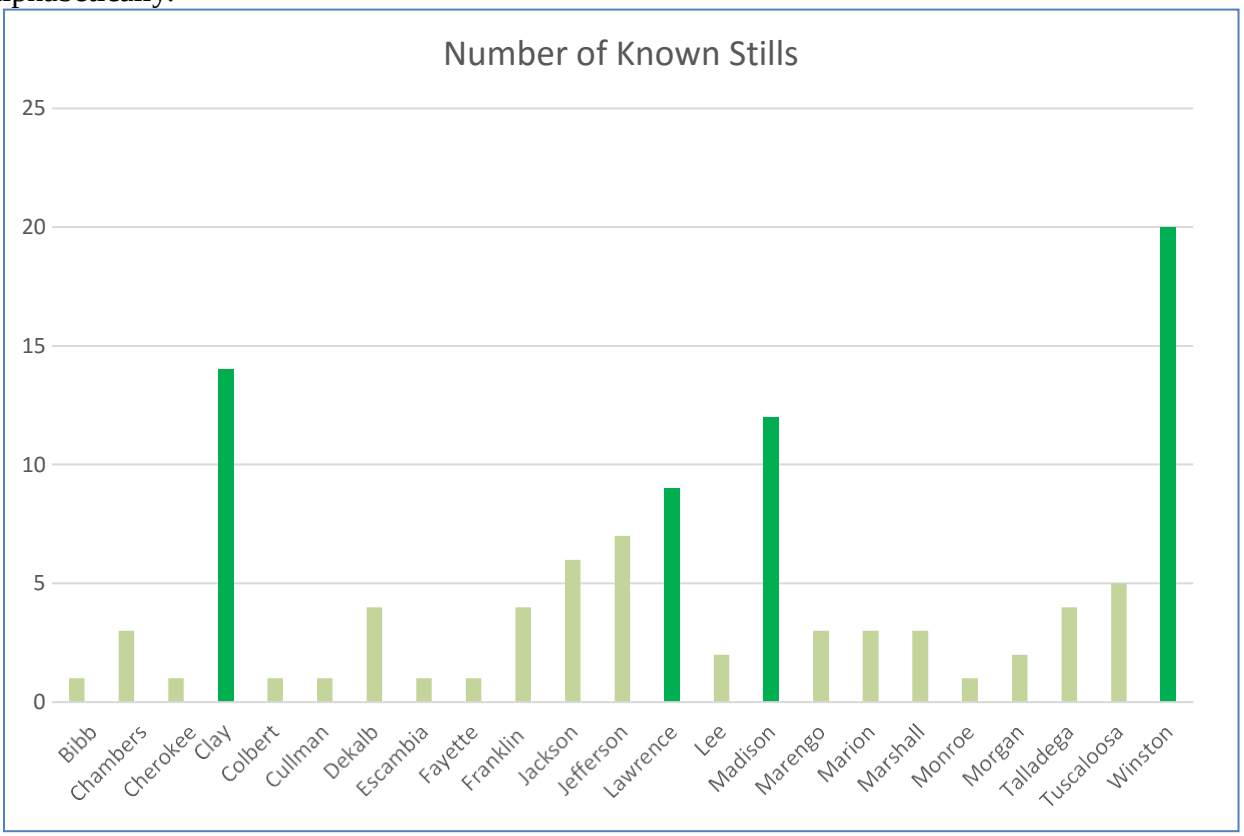
Based on the evidence presented in these results, I have determined that pot stills are the oldest still type, which is reinforced by Blitz's findings. The need to avoid detection from law enforcement led to the development of ground hog stills, which are a similar setup to pot stills, but are buried and use a non-flame heat source. Dead man stills are highly localized, only appearing in two specific locations in Alabama. These appear to be a more regional development, and potentially signify an increased need for hiding stills or a tradition passed down through extended families.

Objective Three: Settlement Patterns

The third objective of my research was to determine the settlement patterns of moonshine stills in Alabama. I completed this objective using both SPSS and GIS to perform cluster analyses. As discussed in the previous chapter, the first step in cluster analysis was to create a base map of all 107 sites in the population (see Figure 1). The base map was used to determine if any clusters would be likely and, as is clearly shown in Figure 1, there are several potential clusters. I determined that a sizeable regional cluster would be made out of at least 10 sites within proximity (within at least 15 miles) of other stills, based on the historical record (Horning 2002; Pierce 2013; Steward 2011) and interviews completed by Joseph Earl Dabney (1974, 1980) and John H. Blitz (1979) with former moonshiners.

I used SPSS to test just how large these potential clusters were. The county location was a variable included for each site, and a histogram was created to determine how many stills were located in each county (Figure 20. Counties with potential cluster areas are highlighted in green.

Figure 20: *Histogram of Counties Containing known Still Sites.* Counties are arranged alphabetically.



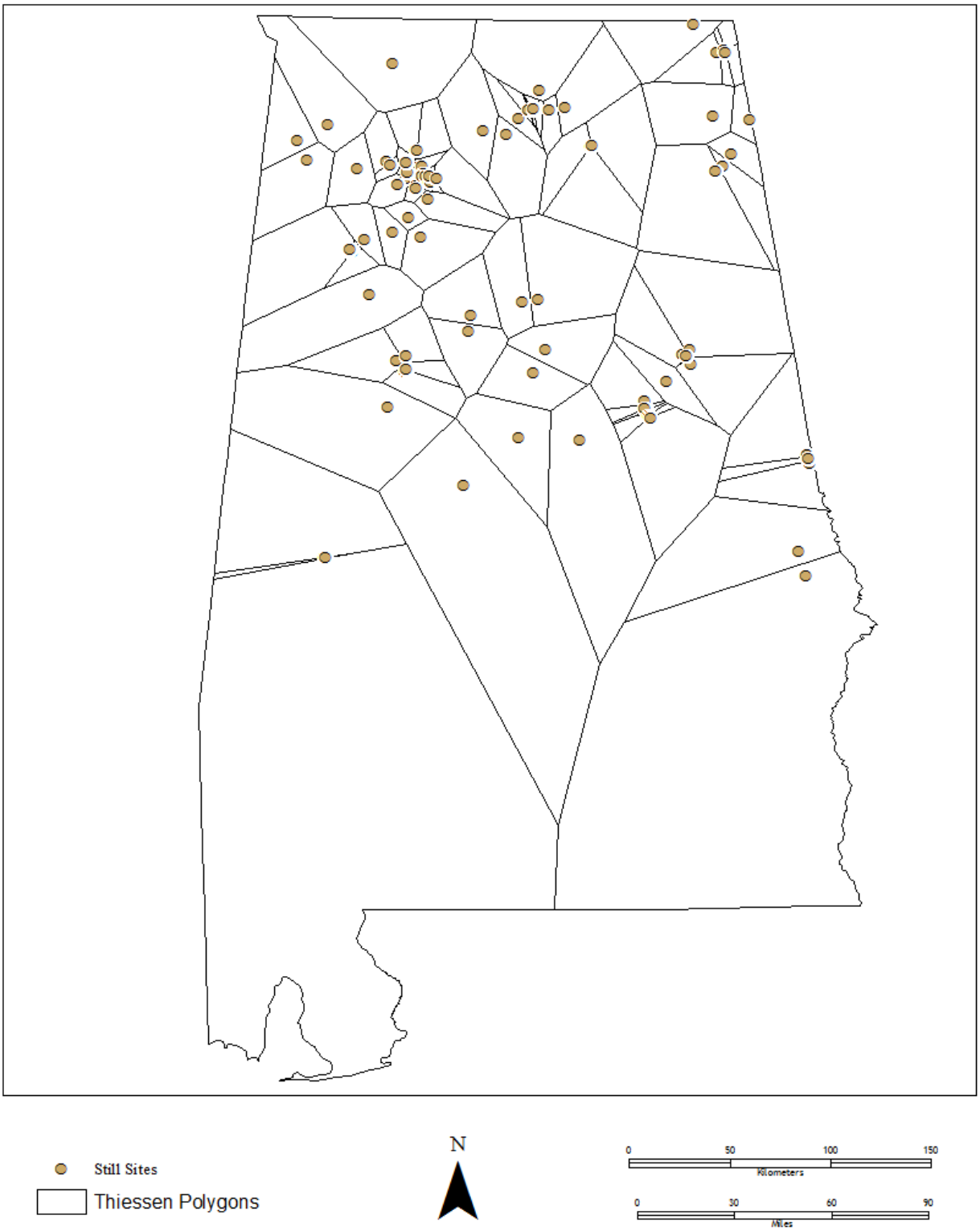
The highlighted counties in Figure 20 present areas of potential clusters. Clay, Madison, and Winston counties all have more than 10 stills present. Lawrence county is also highlighted because all of the still sites present are on the border with Winston County (see Figure 1), which creates a possible large cluster across county lines. Including Lawrence and Winston counties as one cluster, the SPSS output demonstrates three potential clusters: Lawrence/Winston County, Clay County, and Madison County.

The final step in cluster analysis involved using GIS to create Thiessen polygons[7], which are typically used to identify and estimate centralization in prehistoric settlement patterns (Banning 1978; Christaller 1933; Wheatley and Gillings 2002:149-51). For this project, I used

[7] As discussed earlier, Thiessen polygons are polygons generated from a set of sample points; each defines an area of influence around its sample point, so that within the polygon any location is closer to that point that nay other point in the sample.

them to estimate centers of production, or clusters of sites, within the sample. The Thiessen polygons will be smaller and more frequent in areas with site clusters, and larger and further apart in areas where sites are spread widely apart from each other. While the polygons were not necessary to identify cluster locations, creating them made it much easier to determine the size of each cluster. Thiessen polygons could also demonstrate the extent of the production networks in different areas of the state (Figure 21).

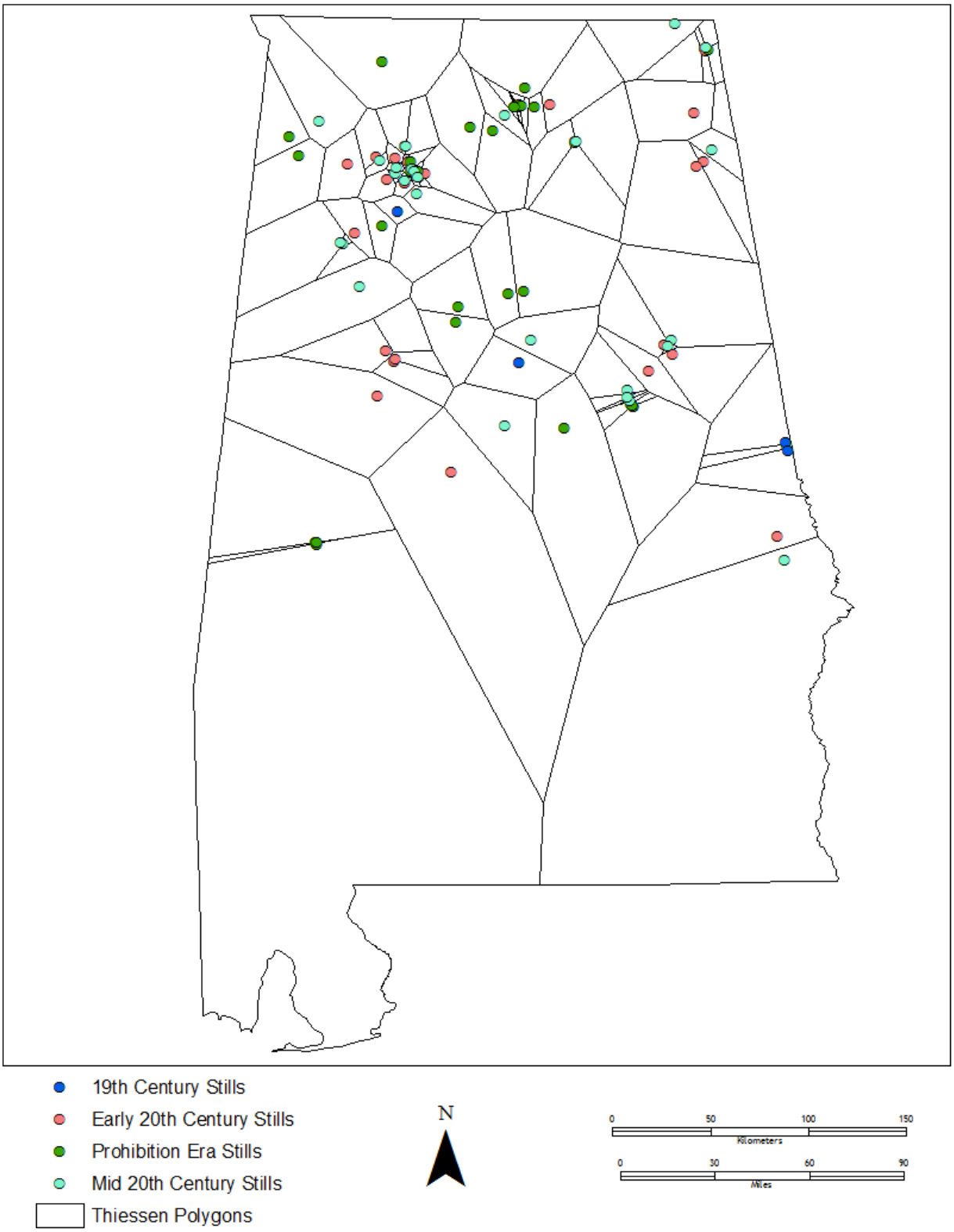
Figure 21: *Thiessen Polygons for Cluster Analysis.*



The results of these sites demonstrate two large clusters: one located in Lawrence and Winston counties, and one located in Madison County. While there were more than 10 still sites in Clay County in the population, the Thiessen polygons demonstrate that rather than one large cluster, two small ones may be present. This can be seen in the base map (Figure 15), with two small groups of sites at opposite sides of the county.

To determine if these clusters were continuous areas of concentrated production or dated to one or two specific periods, the sites were designated by period within the Thiessen polygons (Figure 22).

Figure 22: *Thiessen Polygons with Sites Designated by Period.*

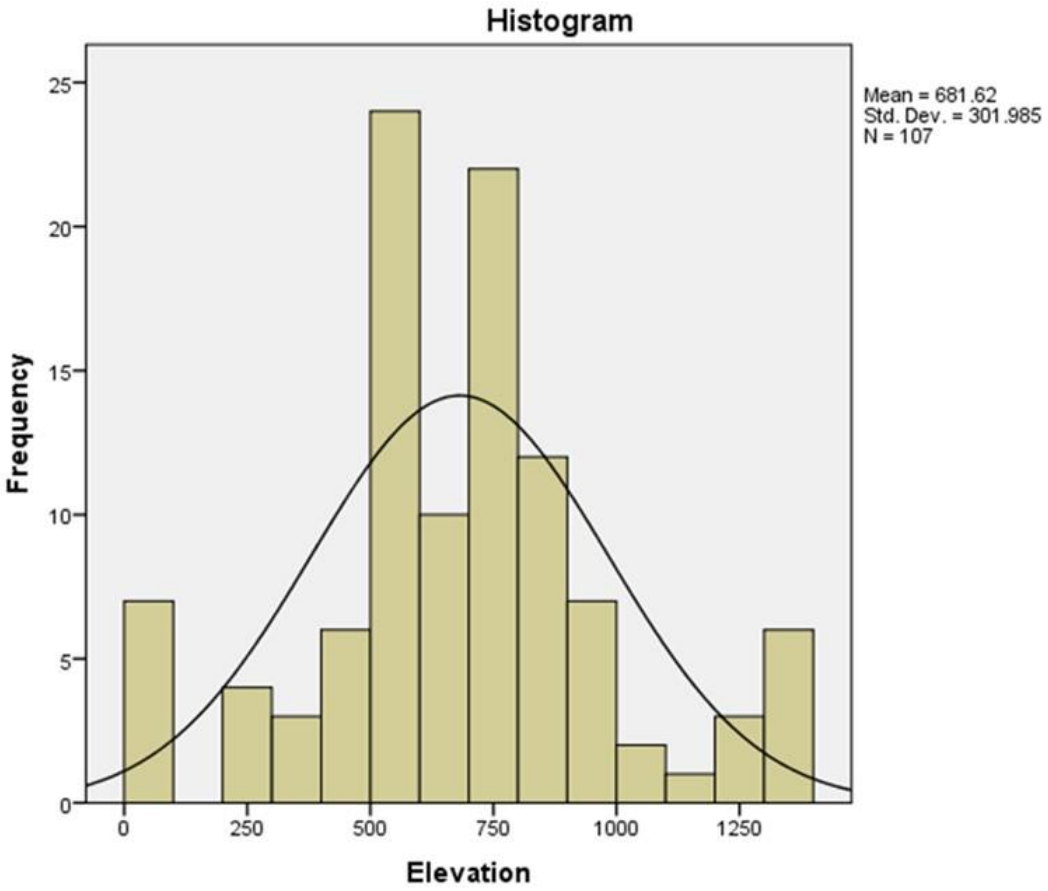


In both large clusters, sites from multiple periods are present, demonstrating the continued practice of moonshine production in these areas. The continued practice in these areas, as well as the close proximity of sites reinforce the recurring references of distillation and moonshining being passed down between familial generations in the historical literature (Dabney 1974: 20-35; Hatch 2004; Peine and Schafft 2012; Pierce 2013; Stewart 2011).

Finally, I used SPSS to test another locational variable: the elevation of all sites in the sample. A t-test was used to determine if there was a significant difference in the mean elevation of all the sites and the mean elevation for the state of Alabama, which is 500 feet. In order to test this, the normality of the variable had to be established; the variable had to exhibit a normal curve distribution, as well as a skewness[8] between -1 and 1 and a kurtosis[9] between -2 and 2. To determine the normality of the elevation of sites, I created a histogram of the data with SPSS (Figure 23).

[8] In statistics, skewness is a measure of the asymmetry of the variable's distribution. A skewness between -1 and 1 is considered a normal distribution.
[9] In statistics, kurtosis refers to the sharpness of the peak of a frequency-distribution curve. A kurtosis between -2 and 2 is considered a normal distribution.

Figure 23: *Histogram of Elevation Variable.*



This histogram demonstrates a normal distribution of the variable, which enabled me to use a one-sample t-test to compare the mean elevation of the sites and the mean elevation of the state of Alabama. Table 3 presents the other information used to establish normality.

Table 3: *Statistics of Elevation Variable.*

Statistics for Elevation		
N	Valid	107
	Missing	0
Mean		681.62
Median		680
Mode		560
Std. Deviation		301.985
Variance		91194.92
Skewness		0.9
Std. Error of Skewness		0.234
Kurtosis		0.602
Std. Error of Kurtosis		0.463
Range		1390
Minimum		0
Maximum		1390
Percentiles	25	560
	50	680
	75	830

A research hypothesis and null hypothesis were created for the one-sample t-test. The research hypothesis (H_A) for this t-test was that the mean elevation ($\bar{x}$) of the sites in the sample (n = 107) would be significantly greater than the mean elevation for the state (500 ft). The null hypothesis (H_0) was that there would be no difference. The alpha level (α) was set to 0.05.

$$H_A = \bar{x} > 500 \text{ ft.}$$
$$H_0 = \bar{x} = 500 \text{ ft.}$$
$$\alpha = 0.05$$

The test results of this t-test are presented as Figure 24.

Figure 24: *Results of T-test.*

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Elevation	107	681.62	301.985	29.194

One-Sample Test						
Test Value = 500						
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Elevation	6.221	106	p < 0.001	181.617	123.74	239.5

One-Sample Test

	Test Value = 500					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Elevation	6.221	106	.000	181.617	123.74	239.50

The p-value ($p<0.001$) was found to be less than the alpha level (0.05), and, therefore, the null hypothesis was rejected. The mean elevation of sites was found to be statistically significantly higher than the mean elevation for the state of Alabama (500 ft). This is most likely because higher elevations would provide natural run-off as a water source, areas that were not easily accessible to law enforcement, and hidden areas such as rock shelters for production areas. Higher elevations were most likely chosen specifically for areas of illegal moonshine production, and the presence of both large clusters in higher elevated areas of the state (See Figures 1 and 20) suggests that moonshine may be more common in areas of higher elevation in general.

Objective Four: Land Use Patterns

The final objective for this project examined the land use patterns associated with stills in Alabama. I focused on four main examples of land use that were commonly found associated with the stills in the sample: how previous or contemporaneous land use affected placement of stills, moonshiners' land use when determining placement of stills, evidence of deliberate environmental manipulation intended to hide sites, and evidence of camping locations associated with sites.

Previous and Contemporaneous Land Use and Still Placement

Previous and contemporaneous land use affected the placement of stills in different ways during each period. During the 19th-century period, when distilling was not necessarily illegal, evidence of houses, stillhouses, barns, and farming are usually present in association with still sites. Historic structures located next to or within 15 meters of older still sites are a key method for determining a still's age. Stills were not placed near structures after Prohibition laws went

into effect because no one would want an illegal activity associated with their own property (Dabney 1974; Stewart 2011: 10). Still houses were often built next to or within the kitchen house, if the property had one, or away from the main structure due to the fire risk associated with heating a still (Stewart 2011). Structures may not leave behind much physical evidence, especially in environments where wood is not well preserved, but they may be recorded on older maps and property records.

During later periods, when production was illegal, previous land use such as older still sites, abandoned properties, or man-made creek dams would have been major factors in determining still placement. Many times, when the tradition was passed down, a family would use the same or very close locations over several generations. In the archaeological record, this is manifested with parts of very old stills or older artifacts associated with more modern still sites – and occurs fairly often within the sample, particularly in the large cluster between Lawrence and Winston counties. Contemporaneous land use such as property lines, public land, national park or forest boundaries, state forest or park boundaries, or industrial activities such as logging or road building affect placement as well. Moonshiners would specifically look for hidden locations where people were not likely to visit and land areas that could not be traced back to them.

Moonshiners' Land Use in Determining Still Placement

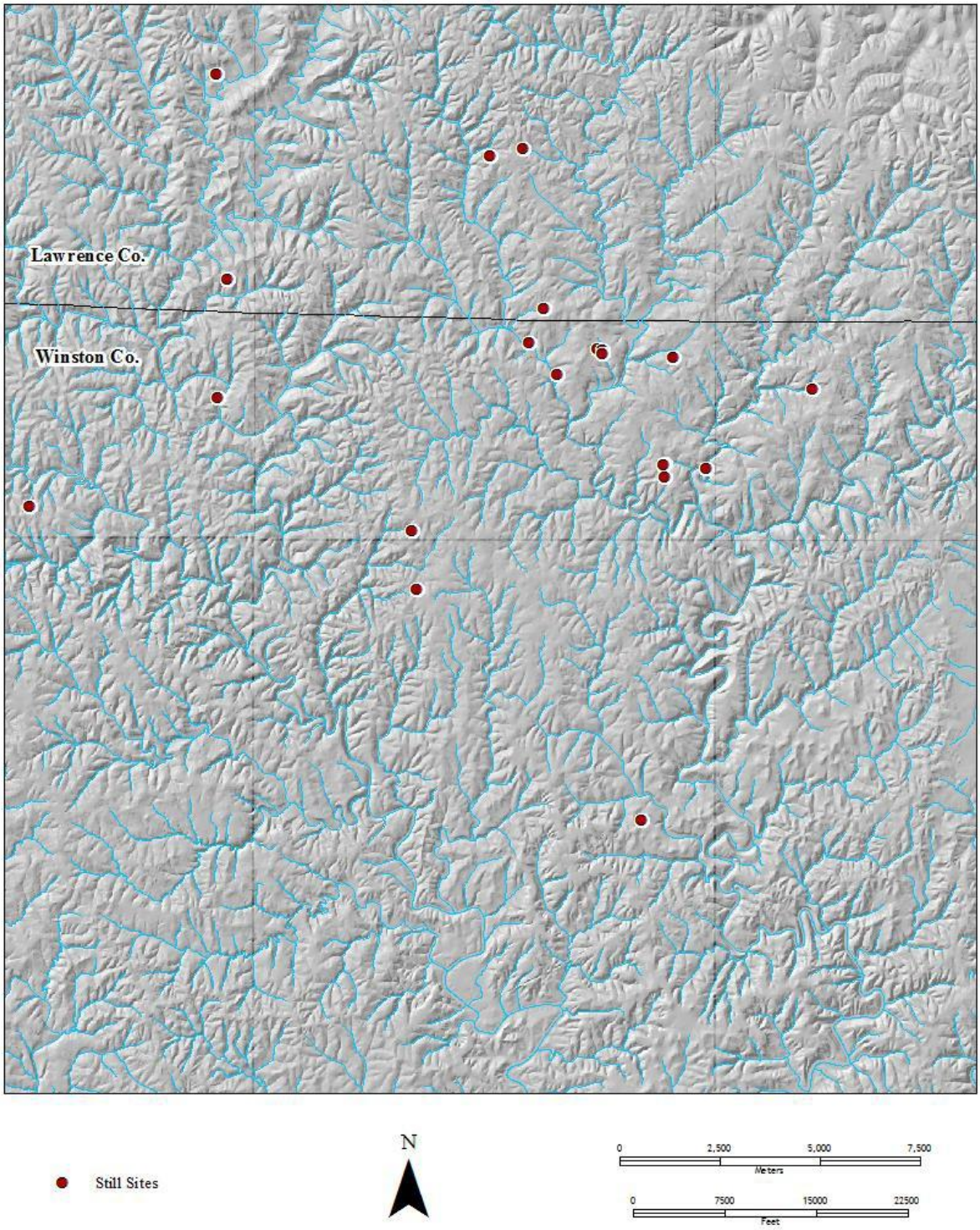
Moonshiners themselves created much of the evidence of land use that is associated with still sites in the archaeological record. The most obvious and basic evidence of this is the stills themselves and their locations. Moonshiners utilized the natural landscape, especially at high elevations, to make water transport to stills easier. If stills were placed down slope from a running stream and pipes were run from the water source to the still, water would flow into the

pipes naturally, rather than having to be carried to the site. The water source itself was vastly important for moonshine production, and is the second most important factor in determining a location after finding a place that is well hidden.

Very particular water sources were identified for use in distillation. Water needed to be fresh, flowing and not stagnant, and soft rather than hard water. Stagnant water was known to spread insects and disease, therefore a flowing water source meant a safer environment for the moonshiner and a better product. Hard water would not distill properly with the corn malt mash of moonshine, and therefore soft water was needed (Stewart 2006: 468; 2011: 15). Early moonshiners learned to identify plants growing along hard and soft water sources, which would enable them to pick the best locations for their production (Dabney 1974, 1980; Meacham 2009; Rorabaugh 1979; Stewart 2011: 15). Revenuers, and later law enforcement officers were given herbology classes as part of their training in order to be able to identify water sources possibly being used by moonshiners (Stewart 2011: 15-16). Modern ATF agents carry PH meters to test water sources when scouting for potential locations or modern operations.

I used GIS to create a maps displaying the topography and water sources for sites in the large cluster between Lawrence and Winston counties. The first map presents all the sites along the Lawrence and Winston county border (Figure 25). The topography of the area is displayed in 3D in grey, the water sources are displayed in blue, and the still sites are displayed in red.

Figure 25: *Map of Cluster between Lawrence and Winston Counties.*



As the map demonstrates, many stills sites are located close together along the same creek branches. The presence of multiple stills along the same tributaries or on the same branches suggests either a community involvement or multiple familial generations. The tightly clustered sites in northeastern Winston County were investigated further to determine whether stills dated to multiple time periods (Figure 26).

Figure 26: *Cluster of Sites in Winston County by Period Categories.*

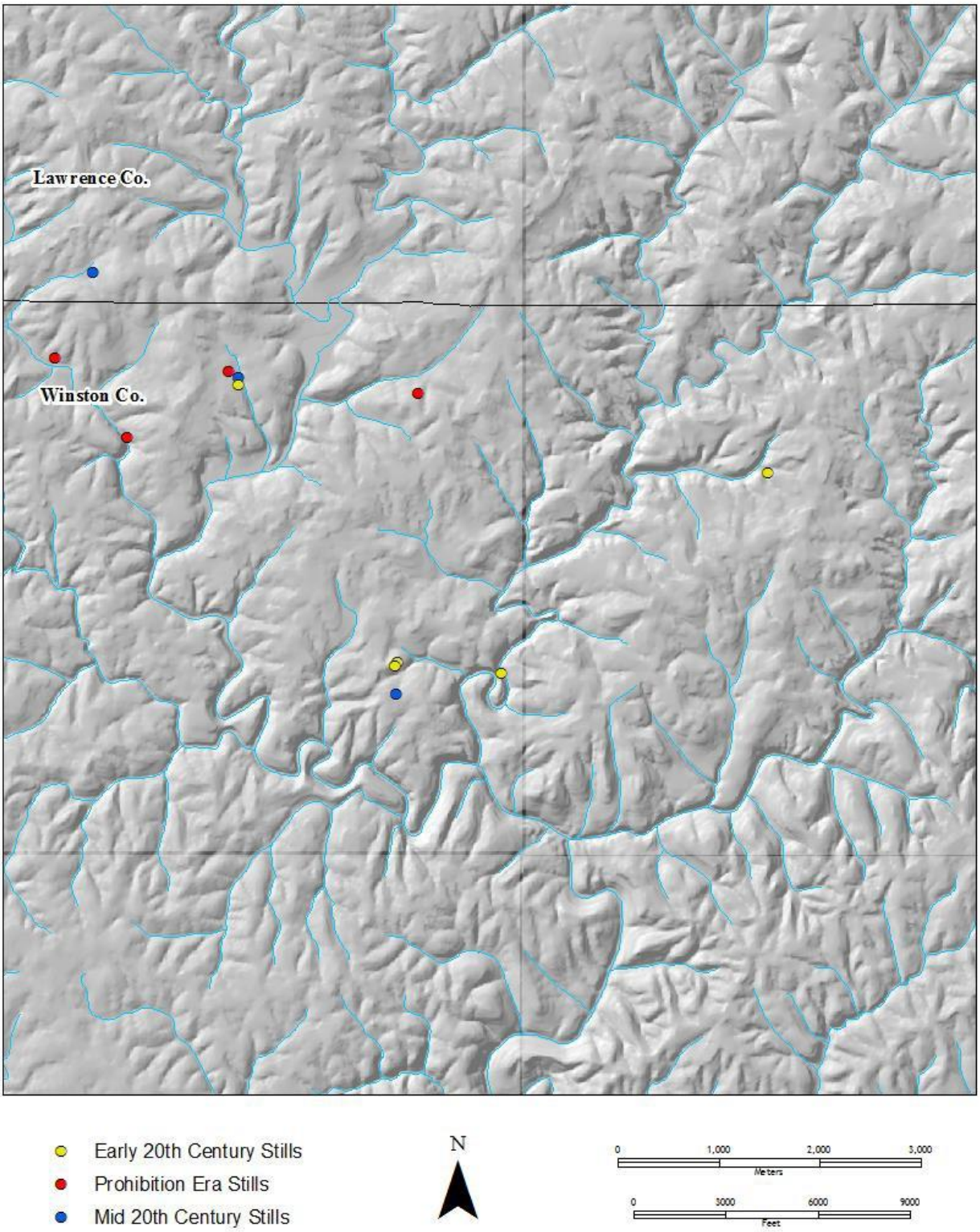


Figure 26 clearly demonstrates the presence of stills from multiple periods – often consecutive periods – along the same branches. This suggests that continuity of practice for moonshine production. Families most likely passed down the tradition of moonshining, including a good location for hiding a site, through generations. Smaller branches may also be seasonal, which would lead to consecutive periods of use over several seasons. Instances of sites from multiple periods along the same braches (Figure 26) demonstrate that not only were the traditions of distilling moonshine passed down through generations, settlement and land use patterns were passed down as well.

Land Use Associated with Hiding Sites

Moonshiners used many methods to prevent their sites from being discovered. Most notably ground hog stills are buried to help hide them, and dead man stills are created to lay low and flat – ideally concealed in drainage ditches. In terms of land use, moonshiners utilized the natural landscape both to hide stills and to provide easy access to water by using gravity to pipe water from streams and creeks downhill to sites rather than carrying it by the bucketful. One difficulty for site placement after production became illegal was locating a well cleared area to set up a still that was close to a water source, while still being somewhat protected from view to prevent detection. To resolve this, several trees were cleared from a small area near their water source and the downed vegetation was used to cover stills. This is recorded in some of the historical literature, namely in interviews completed by Joseph Earl Dabney (1974, 1980) and research done by Daniel S. Pierce (2013), but may be hard to determine in the archaeological record. Some evidence for this can be seen in the presence of very young trees directly within or in close proximity to sites, especially in comparison to a 5-10 meter radius of much older forest.

This can be seen in the photographs of a ground hog still in Tuscaloosa County in Figure 8, in which young trees surround the still site with much older trees further back.

Rock shelters are also a common location used to hide stills in Alabama. Many of the rock shelters in the northern part of the state offer flowing creeks and streams through or near them, higher elevation enabling moonshiners to see anyone approaching, and an enclosed area to keep the heat source going or hide smoke from a fire. Later methods for hiding stills include the use of camouflage or solid dark green and brown tarps to cover sites entirely. More modern stills are already purposefully placed in remote areas to prevent foot traffic of unwanted visitors, and earlier, more complicated methods of preventing detection have become unnecessary.

Camping Locations Associated with Still Sites

Camping areas are the final evidence of land use found in association with moonshine stills. Stills needed to be tended at all times during the distillation process, and after alcohol production was outlawed moonshiners typically camped at or near their sites. There were many approaches to establishing a camp site depending on the site location. In open woods, camp sites were erected uphill from the still so that the still itself and anyone approaching the site from down slope were visible. When sites were located in rock shelters, moonshiners set up camp along with the still since their location provided a ready-made shelter. Unfortunately, many of these locations exhibit prehistoric material underneath the still, and evidence of historic period camping may have disturbed the prehistoric site, such as a campfire location. Finally, some moonshiners chose to place their stills on public land close to home. The ground hog still from Tuscaloosa County, exhibited in the photograph in Figure 8, was located on unowned land over the hill from the moonshiner's house (Personal communication with anonymous source).

Summary

This chapter has presented the results of the three project objectives: to create a typology and chronology of moonshine stills in Alabama and to determine possible causes of still type changes, to identify the settlement patterns of still sites, and to determine evidence of land use patterns associated with still sites. Three still types and four chronological periods were determined, and both chronological and regional causes of still type change were identified. Settlement patterns were determined both through cluster analysis in GIS and statistical frequencies and tests within SPSS. Land use patterns associated with site locations, methods of hiding sites, and camping sites associated with stills were identified and explored.

CHAPTER 6

CONCLUSIONS

My study of moonshine production sites in Alabama had four objectives: 1) discern when in time the site was used as measured by still components and other artifacts; 2) interpret whether still type changes are based on location or time period; 3) interpret settlement patterns of moonshine production in Alabama through the use of GIS software mapping tools, and through identifying common patterns in the county the site is located in, elevation, or type of water source; and 4) identify and interpret land use patterns around still sites to determine what adaptations moonshiners made as the industry became illegal. In this chapter, I summarize my findings and present conclusions.

Chronology and Typology of Stills

When examining moonshine production sites, chronology and type can be determined based on still components, associated artifacts, and location. Components for stills can include mash barrels, boilers, condenser barrels, worms, pipes, furnace boxes, and thump kegs. The materials these components are made from can also aid in determining dates, such as the presence of metal or plastic piping, tarps, broken crockery or glass jars, or ingredient containers. Finally, locations of sites can also help to determine a date. More specifically, proximity to historic structures can designate an older still, while well-hidden stills suggest a later period (when moonshine production was illegal).Still sites in Alabama can be separated into three

different types and four relative chronological periods. The three types are pot stills, ground hog stills, and dead man stills. The four periods are the 19th Century, the Early 20th Century, the Prohibition Era, and the Middle 20th Century. Pot stills are the oldest still type, followed by ground hog stills, and then dead man stills. All three types are present in at least two periods, but not always consecutively.

Causes of Typological Changes in Stills

I was able to determine two probable causes for typological changes in stills in Alabama. The transition from pot stills to ground hog stills appears to be due to political and economic factors, most specifically the outlawing of alcohol production and consumption, which changed over time. As moonshine production became illegal, sites needed to become well hidden. Thus, the transition from more pot stills to more ground hog stills during the Prohibition period is most likely due to the development of this need to hide stills. After Prohibition ended, alcohol production was controlled by the government and organizations, such as the ATF, were established to find and shut down illegal moonshine stills. In order to evade detection and arrest, stills needed to be easy to carry in or out of the woods, easy to set up or break down, and cost effective to build. This probably caused the return to popularity of pot stills in the middle 20th-century period, which are the simplest type in terms of setup, and could be created using lighter materials which would be easy to carry.

Dead man stills, however, appear to have a different cause for typological change. Dead man stills are first introduced in Alabama during the early 20th-century period; however, there are only two of them. This still type is not seen again until the middle 20th-century period, again with only a small number of stills present in the archaeological record (seven total). During the

first instance of dead man stills they are only found in Clay County, while later they are only found in Winston County. The small number present in the archaeological record and their presence in only two locations across the state of Alabama suggests that dead man stills were most likely a localized development. While they are more easily hidden than pot stills, the lack of popularity suggests that this feature may not be adaptable to all environments. The large size of the still barrel and furnace box may also be cost prohibitive, which could have also prevented a rise in popularity of dead man stills. Further research on specific site layouts and potential interviews with moonshiners who specifically used dead man stills may be necessary to confirm the localized development of this still type.

Settlement Patterns

The settlement patterns of moonshine production sites in the state of Alabama are discernable. Definitive clustering of sites (10 sites or more grouped in proximity to each other) are present in Lawrence, Winston, and Madison counties, and many sites are located along the Black Warrior, Chattahoochee, Coosa, and Tennessee rivers. Clusters appear to occur in areas with many potential routes of transport and, therefore, potential routes of distribution for the final product. Sites are also present in these clusters over multiple, consecutive, periods, which suggests a high probability of continuity of practice in these areas.

Furthermore, moonshiners sought locations with very specific attributes. Clear, running, soft water was necessary for production. Small creek branches and seasonal streams were the most common water sources. Areas with higher altitudes were commonly chosen, most likely for the remoteness of the site or the ability to see anyone who might approach from below. This was essential after moonshining became illegal because moonshiners would need to find locations

that were unlikely to be discovered. Higher elevations may have also provided more water sources due to snow melt during the late spring and summer.

Land Use Patterns

The land use patterns associated with still types, though harder to discern than settlement patterns, are identifiable in the state of Alabama. Moonshiners learned specific plants signifying hard and soft water sources to aid in determining still placement. Later law enforcement agents would use these same techniques to identify probable areas where stills might be placed. Stills were erected using the natural topography of a site. This would sometimes include placing the mash barrel and condenser downhill along the water source in order to utilize the natural gravity flow of the stream rather than pumping or carrying water to the still.

Moonshiners utilized the natural topography of an area to hide stills as well, including building stills in rock shelters, drainage ditches, or mountain hollows. Sites were possibly cleared before production began, and this downed vegetation may have also been used to cover stills. Finally, natural topography would have also provided shelter while stills were in operation. Evidence of camping both in rock shelters containing moonshine stills and sites found in wooded areas demonstrates the final land use pattern I examined during this thesis. Sites may have also been located closer to home, while still being located on public, rather than private, land. Further research comparing the layout of individual sites would demonstrate more about how these traditions were passed down from generation to generation.

Future Research

Moonshining in Alabama is a long-practiced historical tradition, and is in fact still in practice today. Typically, these sites are recorded during archaeological surveys, but not

investigated further. My research on this topic demonstrates that moonshine stills can present useful information about the historic past. In particular, stills can provide further information on the subsistence practices and local economy of an area, as well as a well-documented subversive black-market economic system. Moonshine production and distribution was the basis of one of the oldest and largest criminal networks in the United States, which has been documented both in medical and legal records. I would like to conduct future research which further investigates land use patterns and communities of practice based on moonshine production, both in the state of Alabama and in other areas of the United States.

My research may have future implications for the archaeological investigation of criminal activity. Specifically, areas where moonshine production in Alabama was traditionally common are still areas of criminal activity today. Transitions can be seen from moonshine to marijuana and methamphetamine production, possibly because of the development of criminal networks in these areas that have remained relatively intact today. Future research investigating these transitions will benefit anthropological investigations of illicit activity and alternative economies.

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