TOURISM IN EXURBAN POSTINDUSTRIAL FORESTS IN APPALACHIA

THESIS

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By

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ABSTRACT

Tourism in Exurban Postindustrial Forests in Appalachia

The urban-rural fringe often has been an area where the battle over the values of the biophysical and social worlds has played out. When this area involves forestland, the economic worth of the land is often seen only through timber production. The use value of a forest as a forest is actually greater than its exchange value for timber, because of the various possibilities that forests provide economically. Though economic theory often posits that forest valuation for aesthetics occurs only among high-income populations, there is evidence that forests are not simply a luxury good, and that people can incorporate forests into their livelihood strategies. In this thesis, I analyzed the effects of tourism on exurban forest cover in Appalachia. I explored how human desire for outdoor recreation provides economic gain out of a forested setting in natural areas in proximity to a population center. In economically depressed areas with abundant natural surroundings, such as Appalachia, I examined if forested areas can provide a means of living to communities through tourism. I expected that people are found to enjoy forests for their value as an amenity benefit, and are willing to assign economic value in those regards. This led to tourism, by bringing people in to experience the natural surroundings. Appalachian exurban forest cover was found to most associated with the level of tourism in a county. Using data for percentage of forest cover versus economic

indicators related to tourism, I explored the association of forestland to the tourism economy in Appalachia.

Key Words: Appalachia, exurbia, value of forests, land-use, tourism

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CHAPTER 1

1 INTRODUCTION

1.1 INTRODUCTION

The postindustrial economy has transformed society. In the former Fordist based industrial economy, production occurred in proximity to consumption. Due to technological advances in communications and transportation, economic structure was liberated from the need for proximity, moving jobs away from urban cores (Law 2002). Means of economic gain that were previously available have disappeared in some areas due to global shifts in the means of production (Dean and Kretschmer 2007). Appalachia was one of these areas hit particularly hard by the changing economy (Sarnoff 2003). Historically, the extraction of natural resources, such as coal, was a focal point to local Appalachian economies (Sarnoff 2003). Eventually, this became no longer a viable source of income due to changes in the economy and the lack of viable amounts of resources that could be easily extracted (Black et. al. 2005).

In the middle of the 20th century, manufacturing began to be drawn to rural areas of Appalachia, because of their low cost of production, and the decreasing need for

proximity (Jensen and Glasmeier 2001). By the early 1990's, Appalachia was producing more than three times its share of textiles, more than one and a half times its share of apparel and furniture, and more than its share of wood products when compared to the average for the US, making manufacturing a major component to the Appalachia economy (Jensen and Glasmeier 2001). The region was seen as an advantageous place to find labor that was both cheap and skilled, allowing companies to 'outsource' manufacturing to Appalachia from other more prosperous parts of the United States, with the ability to pay Appalachians lower wages (Jensen and Glasmeier 2001).

The last quarter of the 20th century saw new, global economic changes that moved manufacturing from Appalachia to international locations, leaving a declining economy in Appalachia (Jensen and Glasmeier 2001). Concomitant with a loss of manufacturing jobs has been the rise of the service sector in the United States (Herzenberg et. al. 1998). The current situation presents Appalachia as needing employment that fits into the postindustrial economy. Though Appalachia's unemployment rate is only 0.4% below the national average, the labor participation rate is at 61.6%, compared to 67.7% for the US, meaning there are a large number of discouraged workers who have stopped looking for work (ARC 2008).

These changing economic forces created a huge economic shock in Appalachia. This shock also affected the state of land use. Formerly heavily dependent on natural resource extraction, Appalachia's forests have been highly degraded (Gragson and Bolstad 2006). With the decline in former economic bases in Appalachia, forests did not face the destructive forces that they had previously faced. During the last part of the 20th century, forest regrowth occurred as a result of this economic downturn (Gragson and

Bolstad 2006). Once forests have had a chance to regenerate, new economic opportunities can be created. In the postindustrial economy, service sector jobs, such as tourism, can use forests for their non-tradable resource endowments (Deller et. al. 2001), unlike previous economic activities that benefited from removing forests (Johnson and Beale 2002). Thus, if they can be marketed, forests have new economic values in the postindustrial economy.

Exurbia is a unique part of the urban-to-rural gradient. It is found at the far extent of the urban system, still within the field of influence of a metropolitan area. Exurbs still contain some characteristics of a rural area, which are economically reliant on primary sector activities (Daniels 1999). Many exurbanites commute to suburban areas, while at the same time a large part of the economy of exurbia revolves around rural life (Daniels 1999). There is presently a national shift towards urban decentralization (O'Sullivan 2003). Thus, people farther away from an urban core are now more integrated into an urban system through commuting patterns (Nelson and Sanchez 1999). For exurban areas that are forested, such as most of exurban Appalachia, this increases the interaction between people and forests, creating more economic opportunities. With easier access to natural areas, exurbia could emerge as a vital segment of the urban gradient where the economy could benefit from people visiting nature, while still having access to more urban services.

A transition to a postindustrial economy has presented challenges to Appalachia. Per Capita Market Income is only at 77.3% of the US average, the Poverty Rate is at 110.2% of the US average, and the labor force participation rate is only at 61.6% in Appalachia (ARC 2008). The region has been hit particularly hard by the loss of jobs in

the natural resource extraction and manufacturing sectors. This region is more isolated and has a higher rate of poverty than the rest of the country (Russ 2006). New jobs are most likely to stem from the growing service sector economy. Appalachia is also a region with a large amount of forestland (NRI 1997). If it wants to protect the health of these forestlands for future potential, Appalachia needs to find a more suitable economic alternative that benefits both forests and people.

Despite an economic downturn in Appalachia, its rurality and natural resource base can provide new opportunities for economic solutions. Tourism presents itself as one of those opportunities that has the potential of offsetting the declining former economic bases of natural resource extraction and manufacturing. As a provider of service sector jobs, tourism fits in with the postindustrial economy (Cole 2007). Tourism based on forests provides opportunities to come and experience the natural environment, through hiking, camping, off-road vehicle riding, and cultural tourism (Phillips 2008). These activities have the potential to create new jobs, both directly in tourism, and as a result of a spillover effect into housing, construction, and businesses that could lead to a more diversified economy (Reeder and Brown 2005).

Exurbia also presents a unique opportunity to expand the potential of tourism in Appalachia. Throughout Appalachia, there is a high rural and exurban population density (ARC 2008). This increases the interaction of people with forests in Appalachia, as the process of urban decentralization continues. Urban forests have been shown to have great non-consumptive values both socially and environmentally (Tyrvainen 1996), so by bringing more forestland into the urban sphere, metropolitan areas become able to benefit more from the values of forests. Already, Appalachia is centrally located between

major urban areas, such as Atlanta and Washington (Baumann and Reagan 2008), and urban decentralization will only increase the number of people in close proximity to forests. With these processes, forest tourism in exurban Appalachia presents a possible solution to the problems facing Appalachia in the postindustrial economy.

1.2 MOTIVATION

In order to solve the problems facing Appalachia, solutions must be drawn from several subjects. The proposed research lies at the intersection of the literatures regarding Exurbia, Forests, Tourism, and Appalachia. Exurbia explores the land use at the urban-rural fringe, while studies of forests tend to represent them in a rural setting, though forestland can also be significant in more moderately populated areas. Appalachian studies often focus on the economic hardships of the region, while tourism in forests tends to focus on areas with less previous human impact. The motivation for this paper is to connect these different areas of study in order to explore the unique potential forest tourism in exurban Appalachia has as an economic alternative.

1.2.1 EXURBIA

The urban-rural fringe is often an area of conflicting values on how to use undeveloped areas. This area is an elastic edge between the rural countryside, where agriculture and wildlife habitat are prominent, and urban and suburban settings, which have a higher density of residential and commercial use. The duality of what is ‘urban’ and what is ‘rural’ has defined human economies for ages, but is now being blurred on the urban fringe of exurbia. Traditional rural livelihoods have adapted to the realities of

new urban forms. In the United States, the last five decades have brought about drastic changes to urban structure that have impacted the urban-rural fringe. Agricultural structure has changed due to advancement in technology (USDA 2008). Industrialized agriculture requires fewer people to manage greater expanses of land (USDA 2008).

Changes in agricultural technology have led to rural depopulation in some agricultural-dependent areas and agricultural abandonment in others (McTammany 2004). At the same time, technological advancements have affected urban areas, enabling urban decentralization (Glaeser and Kohlhase 2004). These events have lead to great changes in American exurbia and the land at the urban-rural fringe. It is now a common occurrence for people to move away from urban areas to exurban areas because of the prevalence of natural amenities (Jones et. al. 2003). More commonly, people take short trips to the outskirts of their own urban areas or to somewhere regionally, to experience and use nature in the form of a forest, for relaxation and sport (Johnson and Beale 2002).

This ever expanding nature of exurbia can be seen through the landscape in the form of urban sprawl (Daniels 1999). Areas that were once beyond the reach of suburbia quickly and suddenly become subdivisions. Hundreds of acres of farmland can be converted into subdivisions capable of housing dozens of families who desire to live away from the stress of urban life (Daniels 1999). This process is pushing exurbia farther and farther from the city core, expanding the urban fringe. The fringe is an area of rapid growth and transformation, creating a process that keeps exurbia an elastic edge, always stretching to new limits (Daniels 1999).

The view of the ever-expanding landscape presses one to consider the relationship between this process and the natural areas around development. The economic benefits of tourism must be compared to the environmental and social costs. This analysis does not attempt to explain the migration pattern of people towards areas of natural attraction, but rather the draw of people in the form of tourism. These tourists, from the same metropolitan area or from areas beyond, come to these exurban areas to interact with nature in the form of forests. The uniqueness of exurban nature is its proximity to people. Tourism here is focused on seeing nature, but not wilderness. Urban amenities can easily be reached, and access is easier than in rural areas. The potential for economic interaction is open for creative exploitation of the intersection between people and their natural environment.

1.2.2 FORESTS

One type of rural landscape of interest is forestland. Unlike agricultural or urban land, forestland provides a different set of economic values which may warrant further study (Munroe and York 2003). The economic value of forests has historically been attached to resource extraction, but new urban structure is giving forestland new values (Jones et. al. 2003). Forests are an area of environmental habitat, and also create the possibilities for recreational activities. The economic value of forests as a place for tourism in exurbia has not significantly been explored. Humans are drawn to forests because of their differentiation from agriculture and urban areas (Harrison 1992), and this draw can be an economic benefit.

In many rural areas with large amounts of interaction between human societies and nature, the economic potential for forestlands is great. Historically, forests were used for natural resources (Menzies 2007). Timber and wood products are a valuable and necessary commodity used throughout human history for such basic things as shelter and heat. The area underneath forestland can be used to extract natural resources such as coal and natural gas (Fraley 2007). The landscape view that forests have can increase property value, creating value to forests even without their destruction (Kaplan and Austin 2004). The total society value of forestlands can be innumerable.

1.2.3 TOURISM

The changes of land use have created new economic possibilities at the urban-rural fringe, of which one of them is tourism (Johnson and Beale 2002). The tourism industry creates service sector jobs that cater to people traveling and exploring places of interest (Moore et. al. 1995). A prerequisite to a tourism-driven economy is the availability of people with disposable income, who are willing to spend it on something recreational, relaxing, and not essential (Moore et. al. 1995). In the form of tourism, we are allowed to, for a brief period of time, view a world different than our own. This could be anything from a natural landscape teaming with wildlife and endless wilderness, to a foreign city, with cultures and customs that differ from out own. Tourism sells a temporary sense of wonder and escapism (Moore et. al. 1995), which is a valued commodity in an ever increasingly hectic world.

Current trends in society are moving toward increased environmental friendliness, which is causing society to look for means to improve economic conditions without

degrading the environment (Jones et. al. 2003). People enjoy the benefits of economic gains made from extracting resources from the land, but do not like the environmental outcomes when it comes to the degradation of the environment (Jones at. al. 2003). A false assumption is that the use of degraded land is perceived to be limited, and less enjoyable to residents and visitors than more pristine natural areas (McSweeney and McChesney 2004). In societies with excess capital, people are constantly looking at ways to live their lives with as little impact on the environment that provides them with such as great view (Jones et. al. 2003). Tourism of a used environment can be a draw for people, and provide an alternative to a formerly destructive land-use past (McSweeney and McChesney 2004). Appalachia is a used landscape, and its pristine nature has long ago been destroyed. This creates a unique situation in the context of tourism, where people are visiting damaged natural areas for their naturalness. This type of tourism would add a new dimension to tourism study, and could lead to the discovery of new tourism possibilities.

1.2.4 APPALACHIA

One area in the United States where forests are prevalent in exurbia is Appalachia. Development since the arrival of Europeans has typically been hindered by the mountainous nature of the area, and historically this has led to a high degree of poverty in the region (Sarnoff 2003). The environment of the area has been exploited tremendously in order to sustain the struggling economy of the region (Sarnoff 2003). The areas in which human development and nature meet are vast, which is due to the fact that the area is widely populated with a fairly high population density (ARC 2008). Many small and

medium sized cities are spread throughout the hilly landscape, leaving the landscape highly impacted by a history of urban use.

These themes tie together in the current and emerging economic situation in exurban Appalachia. The use of tourism as a means of economic gain in an area with little going for it could be a potential savior for the region. As the economies of industrialized countries turn towards a service economy (Herzenberg et. al. 1998), areas of former manufacturing and resource extraction economies must turn to other means to survive. Tourism provides a sense of future to an area where economic woes have lead to a brain drain, and a since of isolation from general American society (Baumann and Reagan 2008). The tourism economy does not rely on the natural resources that supported the region's economy in the past. Those economic means are no longer viable, and their extraction has already done just about as much damage as it can do, with only Mountain Top Removal mining promising to finish the job of environmental destruction in Appalachia (Fraley 2007). Tourism, for the most part, does not rely on a population that has achieved high educational attainment, which is a group that is sparse in Appalachia (ARC 2008).

Exurban Appalachia has an abundance of valuable resources needed for tourism. The area is moderately populated throughout its swath of America (ARC 2008), unlike the relatively unpopulated mountainous areas of the American West. The settlement of Europeans in Appalachia is rooted in the early days on American colonialism, adding an aura of cultural and historical mystic to this area of natural wonder (Sarnoff 2003). The historical and cultural element of Appalachia is a draw that other natural areas in the United States cannot match. The history of the region, well documented due to its early

European contact, included Native American lore, colonial frontier adventure, and the carving out of a unique cultural identity based on isolation and self sustainment (Sarnoff 2003). This cultural uniqueness greatly enhances the tourism possibilities of the region, because the nature of the area has a social meaning attached to it (Utz 2001). In the hills and forests of Appalachia, people see a history, a culture, and see a need to experience a part of this unique part of the world.

Forestland is abundant, in the form of private and public lands (NRI 1997). Farms are found in more fertile areas along rivers and streams (Otto 1983). Mines take up large chunks of hillsides in certain areas, and other natural resource orientated industries are scattered about, trying to make any economic gains that remain to be made from the destruction of the landscape in the area (Fraley 2007). Development is also hindered by the landscapes of hills and valleys of Appalachia (Sarnoff 2003).

The Appalachian region has long been studied as America's example of a Third World Country (Gragson and Bolstad 2006). Poverty-stricken, undereducated, and lacking of economic bases that do not destroy the environment, outsiders have long attempted to come in and solve the region's problems (Sarnoff 2003). Recently, Appalachian study has spent a considerable amount of attention on the possibility of tourism in the region (Johannsen 2004). There is an attempt by some to remarket Appalachia as an area where people can escape the urban woes of the Northeast and Midwest to come enjoy the natural beauty of forests (Johannsen 2004). The dynamics of exurbia and the different relationships with human impact have not been thoroughly explored as to the relationship with tourism in Appalachia. The tourism occurring in the area is not usually pegged with being exurban, but it usually is. Appalachia is widely a

moderately populated region, contrary to popular beliefs of areas of vast uninhabited regions (ARC 2008). The isolation of the region was greatly reduced in the twentieth century by the building of road networks (Isserman and Rephann 1995), and these same roads allowed for exurbanization to occur around Appalachia's many urban areas. This research explores the relationship between tourism and exurbia, an area often ignored in studies of tourism in Appalachia. New urban form's ability to create economic possibilities in natural areas will allow future exploration of economic resources that are still untapped in Appalachia.

1.3 RESEARCH OBJECTIVES

This research adds to the existing literature in several fields: exurbia, tourism, and the study of the Appalachian region. Literature on exurbia widely focuses on its form of development. Urban form is usually the main focus when studying exurbia, including the nature of where development occurs in exurban areas and the pattern of its growth. Other areas of exurban study focus on why people want to move to exurbia, focusing on its sense of rurality, lower population densities, and aesthetics (Deller et. al. 2001). The role of tourism on this landscape would add a new factor to the study of exurbia, especially one that presents tourism in natural areas as an economic alternative, building off of the ability to connect natural areas in proximity to urban areas to the economy of a region. Exurbia is often seen as beyond the economic core of an area, and its analysis is viewed more from a residential perspective (Irwin and Bockstael 2002). Traditional urban structure models have people living in the exurbs and working in the urban core

(O'Sullivan 2003). But there is economic gain to be made from the exurbs, and their relationship with natural surroundings, and this paper will explore those possibilities.

These added perspectives of existing topics will enhance understanding of the dynamics of the region beyond the entirety of the current literature. The idea of tourism as an exurban phenomenon has yet to be fully explored. The nature of exurbia in Appalachia has not been explored in depth as it has in other regions of the country, due to its perceived social and economic problems. The nature of the natural environment on the urban-rural fringe in Appalachia is in need to be further studied, to examine how a damaged environment can be used, taking into consideration a long history of devastating land-use. Keeping all of this in mind, this paper attempts to analyze the effects of a situation that is at the edge of several disciplines, but has yet to be explored on its own.

This paper will explore the ability of forests in exurban Appalachia to be an economic and environmental alternative to other land uses. The previous volumes of related literature will be delved into, as to what previous studies have concluded on related topics. The Appalachian region will be explored, as to what it is, and how its history represents the current situation in the area. Data will be collected and analyzed in areas such as forest cover, tourism measures, and economic factors for counties of exurban nature in the Appalachian region. The results, then, will be related back to the hypothesis, and directions of possible future research will be outlined.

1.3.1 HYPOTHESIS

- 1: Tourism will play a positive role in the economy, as measured by the location quotient for the impact of tourism and the per capita market income

- 2: Tourism is affected negatively by rural poverty, because the rural poor are disconnected from urban systems
- 3: A Tourist economy helps reduce rurality, which measures if tourism is a catalyst for exurbanization and development
- 4: Forests will decrease with the lack of rurality of an area, which measures how development is impacting the environmental impacts of forests with the removal of forest cover

1.4 SUMMARY

Poverty and high unemployment rates have persisted in postindustrial Appalachia. One solution has been tourism, in the form of forest tourism located in exurban areas. This analysis explains why each topic that forest tourism in exurban Appalachia revolves around is important, and how they are connected through their common relation to economic change. Data was used to study what impacts these effects are actually having. By analyzing data on this collective set of processes, was able to have a better understanding of how tourism can play a role in changing the economy of Appalachia.

CHAPTER 2

2 LITERATURE REVIEW

2.1 INTRODUCTION

In Appalachia, tourism is enabled by forest regrowth and facilitated by urban expansion.

New economic realities have fundamentally changed the nature of exurbia, forests, and tourism. The lack of an economic alternative to former economic bases is a problem in Appalachia that needs to be solved. One possible solution is forest tourism in exurban Appalachia. Can forest tourism bring economic growth to Appalachia? To find out, we must draw from a diverse set of literature. Exurbia's growth and ability to sprawl out into the countryside is made possible by new economic realities in transportation, job structure, and the decrease of the importance of distance. Forests have been given new values by a new economy that no longer depends on resource extraction to sustain itself, but finds forests valuable for the ability to be used in situ. Tourism, as an economic base, is an example of a postindustrial activity providing opportunities to areas formerly

involved in manufacturing and natural resource extraction. It is where these processes, set forth by new economic realities, meet that forest tourism in Appalachia can occur.

2.2 ECONOMIC STRUCTURE

2.2.1 INTRODUCTION

In order for one to understand how the possibility of forest tourism in exurban Appalachia is occurring, one must understand the economic circumstances that preceded this. The cycles of the economy create a situation of constant change, and new opportunities can create new economic realities. The postindustrial economy created the opportunity to transform an area that was faced with economic decline into an area that can reap the benefits from the new means of economic gain that are presenting themselves. In order to measure how to do this, one must understand how to measure economic bases, and the impact of economic sectors on a regional economy.

2.2.2 POSTINDUSTRIAL ECONOMY

The economy of the United States has gone through a postindustrial transformation throughout the last half century. This transformation has involved both the decline in the manufacturing economy and the rise of a knowledge-based economy (Dean and Kretschmer 2007). From 1940 to the mid 1990's, the proportion of Americans working in the service sector increased from one-half to three-quarters (Herzenberg et. al. 1998). During this same time period, the manufacturing sector, which had sustained the industrial economy, which had been previously dominant, declined with the rise of the

service sector (Herzenberg et. al. 1998). All of this created the present new economic reality, in which a knowledge-based service sector is dominant (Dean and Kretschmer 2007).

This transformation in economic bases has been due to the ability of knowledge to replace whole factors of production that dominated the previous manufacturing sector (Dean and Kretschmer 2007). Primary competitive factors have spawned new types of innovation and growth (Dean and Kretschmer 2007). Instead oftrying to revive the former manufacturing economy, the last quarter century has seen government policy shift to trying to improve the emerging knowledge economy (Dean and Kretschmer 2007). Some have cautioned that the types of economic bases that have emerged in the postindustrial economy are weak, and that the service economy can be blamed for increased inequality, declining productivity, and stagnant wages (Herzenberg et. al. 1998).

Postindustrial economic realities have also changed the agricultural sector in the US. The number of farms in the US has been declining since the 1940s, to have only leveled off in the previous decade (USDA 2008). The size of the average US farm has been rising for the past century, particularly since the 1940s (USDA 2008). With the advent of new technologies, fewer people have the capital to operate and invest in larger farms (USDA 2008). Also, advances in technology make fewer farms able to produce the same amount of food (USDA 2008).

2.2.3 MEASURES OF ECONOMIC STRUCTURE

There are numerous ways one can measure the impact of a sector on the local economy. Time series analysis involves plotting data trends for an industry over time for one or more geographic areas, which can be shown in line or graph form (Cortright and Reamer 1998). This method can use raw numbers, percentages, or a comparative figure. Cross sectional analysis examines the distribution of one variable by other variables at one point in time (Cortright and Reamer 1998). This is easiest explained with a pie chart or bar graph. An example would be a pie chart split into pieces, each representing a component of a local economy (Cortright and Reamer 1998). Shift-Share analysis is a means of attributing change in a region's economy to various factors, done through decomposing local economic changes (Cortright and Reamer 1998).

There are issues with measuring data for economic analysis. In order for an economic analysis to be done correctly, data must be measured consistently, using the same types of data (Cortright and Reamer 1998). The scale of analysis can also be an issue. Generally, the smaller the size of an area that is being analyzed, the less economic data that is available for it (Cortright and Reamer 1998). Some economic factors such as skill level and turnover rate have no standard variable (Cortright and Reamer 1998). Economic data at a large scale is usually obtained from three main sources: The Census Bureau, the Bureau of Labor Statistics, and the Bureau of Economic Analysis (Cortright and Reamer 1998).

2.2.4 LOCATION QUOTIENT

Another measure of economic structure is the Location Quotient. The Location Quotient (LQ) has been used by economic researchers since the 1940s (Miller et. al. 1991). The LQ has become one of the most basic tools of economic development research and is considered simple to use (Miller at. al. 1991). The LQ, as an economic base, measures the extent to which the contribution of one subgroup of economic actors of a regional economy is greater or less than the contribution of that subgroup to a larger, reference economy (Cortright and Reamer 1998). It is computed by dividing the percentage of the industry in the study region's economy by the percentage of the industry in the larger reference economy (Cortright and Reamer 1998). An LQ of less than one means that the industry is underrepresented when compared to that of the larger reference economy (Miller et. al. 1991). Similarly, if the LQ has a value above one, it has a larger share of the industry than that of the reference region as a whole (Miller et. al. 1991). An LQ of one means the study region's share of the industry is identical to that of the reference region's share of that industry (Miller at. al. 1991).

There are some problems that one faces when using the Location Quotient in analyzing economic data. In order to compute an LQ, one must have a complete set of economic data for all sectors for both the study area and the larger comparative region (Miller et. al. 1991). When the results are given, the LQ is not meant to interpret what the results mean, but simply gives one a LQ number (Miller et. al. 1991). Measuring change in LQ is problematic because an LQ is based on percentages (Cortright and Reamer 1998). Thus, an industry may appear to make significant improvements in their LQ, but may not have grown at all, because a decrease in economic output of other

industries can increase another industry's LQ without that industry actually increasing itself (Cortright and Reamer 1998). The LQ is considered a simple method of economic analysis, and sometimes is considered too simplistic for some forms of economic analysis (Miller et. al. 1991).

2.3 EXURBIA

2.3.1 INTRODUCTION

Exurbia is a key to understanding forest tourism in exurban Appalachia. Change is abundant in exurbia, which defines itself by constant creation and expansion of development. The area is in a constant flux, with exurbia turning into suburbia, creating an ever changing situation that is always creating and disposing of economic opportunities. This flux is possible because of new economic realities, which decrease the need for people to be close to central cities, allowing development to occur farther outward in a metropolitan area. The frontier between suburbia and rural that exurbia represents allows for a unique relationship between people and their natural environment. This situation also provides for unique opportunities economically as well, for people to benefit for forestlands that are in close proximity to society.

2.3.2 EMERGENCE OF EXURBIA

Exurbia is a relatively new part of the urban spectrum. Until the early part of the 20th century, the monocentric city was the dominant urban form (O'Sullivan 2003). This type of city was heavily concentrated on proximity to the central core of a city

(O'Sullivan 2003). The closer land was to the central city, the higher the value that was placed upon that location. The idea of locating near the core of a city was seen as desirable (O'Sullivan 2003). The central core of a city was concentrated with commercial uses that could afford to bid for the higher rents in a prime location (O'Sullivan 2003). In present-day America, this form of cities has become a rarity, and today few large cities are structured in a monocentric form (O'Sullivan 2003).

Many factors went into the decentralization process of turning monocentric cities into cities with large low-density fringes, a process that created present-day exurbia. Declining costs in commuting have allowed people to travel from exurbia to more populated areas with greater ease (Irwin 2007). Rising incomes have allowed people to demand larger houses with larger properties (Irwin 2007). Property at the urban edge is cheaper than in urban and suburban areas, making it more attractive to people wishing to relocate (OTA 1995). Exurban areas have attracted to people wishing to escape the negatives associated with urban blight, with people leaving central cities to escape urban problems (OTA 1995). Exurbia is a draw for residents, because of the natural amenities and a level of privacy that exurban areas provide (OTA 1995). People also move to exurban areas to follow jobs that have left the urban cores of metropolitan areas (Irwin 2007).

Technology has also been a factor in recent decades in encouraging the development of exurbia (OTA 1995). The industrial economies of the world are currently in the midst of a technological revolution (OTA 1995). The prevalence of microelectronic technologies has been a significant factor in this period of change (OTA 1995). These technologies reduce the dependence of a metropolitan area on a central

city, due to the ease of transferring information across space (OTA 1995). This allows for the spatial dispersion of economies, which allows for economies to operate in exurban areas (OTA 1995).

2.3.3 DEFINING EXURBIA

The problem with the topic of exurbia is that there is not a standard agreed upon definition (Martinuzzi et. al. 2006). Various variables can be used to determine if a place is exurban, such as an area's place in the urban spectrum, population density of an area, acres per residential piece of land, or the relationship to Core Based Statistical Areas (CBSAs). In current literature it is common to think of exurbia's place on the urban spectrum as lying beyond the suburbs of an urban area (Nelson and Sanchez 1999). It can be seen as an area beyond the suburbs, but still in their shadow, and a step between rural areas and more developed areas (Daniels 1999). The line between what areas are suburban and which are exurban is not always clear, and some believe that exurbia is in many ways just the outer extension of suburbia (Nelson and Sanchez 1999). The distance from a city at which exurbs are found can also be uncertain, with a range being five to 50 miles (Theobald 2001).

A common measure of density to determine exurbia is persons per square mile (Theobald 2001). Through, at what population density exurbia is reached is up for debate. A population density of 1,000 persons per square mile is generally considered urban (Nelson and Sanchez 1999, Daniels 1999), and exurbia is considered to be far less than that, usually less than 500 persons per square mile (Daniels 1999). One range that can be seen as broadly covering exurbia can be 40 to 325 persons per square mile

(Exurban Change Program 2008). Other definitions take into account the size of residential lots to determine exurbia. One definition states that lots in exurbia are an average of 10 to 40 acres large (Theobald 2001). Others can split exurbia into broader categories, such as emerging exurbia, with lots sizes of 16.5 to 165 acres, and more developed exurbia, with lot sizes of 1.65 to 16.5 acres (Exurban Change Program 2008).

Another way to determine if an area is exurban is to find a measure of its rurality, which is its amount of rural characteristics or traits, that an area shows (Princeton 2008). Some definitions use the proximity to CBSAs with a combination of other factors such as population density to determine if an area is exurban or how exurban it is. One measure of rurality is the Index of Relative Rurality (Waldorf 2007). This index measures four dimensions: population, population density, extent of an urbanized area, and the distance to the nearest metropolitan area, and assigns counties a value on a scale from 0 to 1, with 1 being the most rural (Waldorf 2007). Another definition of rurality is the Urban Influence Codes. These are used by the US Department of Agriculture and take into account CBSAs, proximity to CBSAs, population, and population of CBSAs, measured in categories numbered from one to 12, with 12 being the most rural (USDA 2007).

2.3.4 LAND USE IN EXURBIA

Exurbia is also characterized by the changes in land use occurring there. The exurban fringe is a fast growing area, rapidly changing in nature (Berube et. al. 2006). While the outer parts of suburban areas are the fastest growing part of a metropolitan area, exurban areas just beyond them are just starting to grow, but also at a fast pace (Lang and Sanchez 1999). This makes exurbia a fluid region that is constantly

suburbanizing (Daniels 1999). Though they are considered the core of an area, major cities take up only a small part of most metropolitan areas (Daniels 1999).

Much of the space of a metropolitan area is its outer reaches, which consists of small towns among nature and farms, where exurbs can emerge (Daniels 1999). These emerging exurban areas are taking the place of the previous land-uses, which are usually natural areas or farmland (Theobald 2001). Indeed, farmland in the United States is decreasing at a rate of 5.39 million acres per year, much of which is to exurban development (Theobald 2001). This creates areas where agriculture is giving way to housing, which is typical of exurbia (Daniels 1999). Improvements in technology have made population decentralization easier to occur, such as that occurring in exurbia (Nelson and Sanchez 1999). Distance to services in the urban core is no longer a priority, and the possibilities for exurbanization are much greater today than previously (Nelson and Sanchez 1999).

2.3.5 ECONOMY OF EXURBIA

In many ways, exurbia is also defined by its economic bases (Daniels 1999). Along with the transition of land uses, exurbia is in a transition of economic bases. In exurban areas in economic transition, agriculture still plays a key role in the economy (Daniels 1999). There is also an influx in industrialization that occurs in exurban areas (Nelson and Sanchez 1999). Because of urban decentralization, jobs have the ability to move out of urban cores to exurban areas, changing the economic base of areas. The majority of jobs in an average metropolitan area are more than 10 miles away from the downtown area (Berube et. al. 2006), leading to expansions in jobs in exurbia. Just as

people might be moving out to exurbia to follow jobs, jobs are also moving to exurbia to follow people (Irwin 2007). The new exurbanites can be seen as a good labor force, attractive for businesses (OTA 1995).

Changes in technology and infrastructure have also brought an expanded economic opportunity to exurbia. There has been a decline in transportation costs, making areas father away from central cities and population centers more attractive places to locate (Irwin 2007). There have also been changes in transportation systems and infrastructure, such as the emergence of highway systems, which have made distance less of a factor in exurbia (Irwin 2007). Technology changes have also helped to bring employment to exurbia, by allowing for easier communication and more advanced manufacturing systems (Irwin 2007). With these changes, the exurban economy is no loner as harmed by its distance from a city.

2.3.6 CHALLENGES OF EXURBIA

One main issue facing exurbia is the distance of exurbia to the rest of a metropolitan area, and long commutes necessary to reach jobs and services (Lang and Sanchez 2006). Typically, at least 20 percent of workers in exurban areas have a significant commute to work (Berube et. al. 2006). The ability to commute is a key element to the ability to exurbanize (Nelson and Sanchez 1999). Exurbanites tend to work jobs that are not centralized in the core of metropolitan areas, but instead further out in the urban spectrum (Nelson and Sanchez 1999). This enables exurbanites to have relatively short commutes for their distance away from the urban core, making their commutes comparable to that of suburbanites (Nelson and Sanchez 1999).

The process of urban sprawl creates other challenges to be faced in exurbia. These challenges are due to the fact the exurbia is a fluid area of struggle, trying to keep its more rural feel while it often quickly transforms into a suburbanized area (Daniels 1999). Traffic, energy consumption, community services, reduction of open spaces, and pollution often face areas in transition (Martinuzzi et. al. 2006). Traffic and the impact of cars are due to the fact that in exurbia and suburbia, automobiles are the sole means of transportation, with a lack of public means of transportation (Martinuzzi et al 2006). The process of urban sprawl chips away at rural and undeveloped land as well as forest land that exist near metropolitan areas (Hermansen and Macie 2002). When urban development is built faster than population growth occurs, urban sprawl spreads development beyond the core of cities, which creates problematic disorganized development (Barlow et. al. 1998).

Exurbanization can also be problematic because of the divided nature of the ownership of land on the urban fringes. The process of exurban development leads to situation of divided ownership of forestland on the urban-rural fringe, in the form of parcelization and fragmentation (Kendra 2003, Bliss 2003). Parcelization, as ownership of a forested landscape that is divided among two or more owners, creates a more likely situation of divided values and interests of land owners, making the land more difficult to manage (Kendra 2003). Fragmentation, as the physical separation of parcels of forested land from each other, results in habitat destruction and loss of management options (Bliss 2003). Forested lands at the exurban fringe are in the greatest danger to suffer from the problems of parcelization and fragmentation, which can help decrease their value with divided interests of owners (Kendra 2003).

Exurbia's proximity to nature often presents a challenge. Exurbia is an area where there is increased interaction between people and their natural surroundings. It is at this interface where forests and other wildlife areas are greatly affected by development, beyond the urban and suburban areas where forestland is already lost, and before the rural areas where development is sparse (Glennon and Kretser 2005). Exurbia is a combination of types of development that add up to create a large impact on nature (Glennon and Kreser 2005). Everything from the building of roads to the use of nature for human recreation causes impacts. Negative impacts of people on their environment in exurbia include loss of natural lands, environmental degradation, and fragmentation of land used by wildlife (Glennon and Kreser 2005).

2.3.7 EXURBANITES

America is a suburban nation, with 53% of the US population living in suburban areas (Berube et. al. 2006). Some argue that the demographics of exurbia are similar to that of suburbia (Nelson and Sanchez 1999). Exurbanites tend to be white, middle-class, homeowners, and commute to their place of work (Berube et. al. 2006). Exurban households tend to have a traditional family structure, even more so that a typical suburb (Nelson and Sanchez 1999). The types of occupations that exurbanites have tend to be clustered around professionals and skilled blue collar jobs (Nelson and Sanchez 1999).

At the urban-rural interface, there is both a geographic area where forest management meets urban development and a political area where people holding different forest values, such as old landowners and new landowners, interact (Vaux 1982). The urban-rural fringe attracts new homeowners who move there in order to get

closer to nature and to have increased space (Kaplan and Austin 2004). This societal interface at the fringe often creates a situation where the new values of development and urbanization win out, and often contradict the reason the homeowner moved out to the fringe in the first place (Kaplan and Austin 2004). These needs often demonstrate the power relations between the newer, wealthy residents, and the native residents who are of lesser income, and are forced to accept change. When building at the fringe, new homeowners often then desire the amenities of urban areas, leading to the clearing of the very forests and natural areas that they moved to enjoy (Kaplan and Austin 2004). This process of people moving farther and farther out to experience natural areas leads to further exurbanization.

2.4 FORESTS AS A NATURAL AMENITY

2.4.1 INTRODUCTION

The social value of forestlands changes along with social changes. With new economic realities, forests have the opportunity to serve new purposes. The relationship between people and forests is changing towards finding new values in forests as a land-use, rather than an obstacle to land use. Forests are important to society, and have a unique setting of opportunities that create the condition for forest tourism in exurban Appalachia. These unique opportunities come for the set of actors and processes that only occur in forested areas. People are drawn to the values that forests have, and this pull factor results in tourism. The economic values of forests are great, and come in a

wide variety. The ability to tap into economic opportunities is crucial for forested areas to be beneficial.

2.4.2 FORESTS AS A UNIQUE LAND COVER

Forests present a unique type of land cover with a particular set of values that differ from all others. In today's busy and fast-paced society, forests are a counterbalance to urban society, and are unique for their sense of timelessness (Hayman 2003). There is a set of environmental values that are unique to forests, such as the ability to support a diverse habitat home to a wide variety of plant and animal species (Phillips 2008). The economic values of forests are also unique, presenting opportunities that are not found in areas of agriculture or urban areas (Munroe and York 2003). Recreational opportunities are unmatched by other land covers, providing opportunities to hike, fish, camp, paddle, rock climb, and many other outdoor activities (Phillips 2008).

2.4.3 ENVIRONMENTAL BENEFITS OF FORESTS

Environmentally, forests are of a vast importance to the planet. Forest cover is a great regulator of climates on a global scale. The earth's atmosphere is affected by forests because they are an important element in the global cycle of gasses (Saxe et. al. 1997). Forests function as the lungs of the planet, exchanging large amounts of CO_2 with the atmosphere, providing a living place for flora and fauna, including humans (Saxe et. al. 1997). The habitat they provide allows species displaced from urban areas to seek shelter. Key areas of habitat are found in forested areas, protecting endangered species (Phillips 2008). Forests also hold plants that may be needed for future medical cures

(Menzies 2007). Without forest lands, soils begin to degrade and erode, drastically changing ecosystems. The soil of a local area depends on trees in forests to prevent run-off and erosion affecting the water quality of an area (Menzies 2007). These vital aspects of forests on the global environment outline the role forests play in the very survival of the current state of the planet.

2.4.4 ECOSYSTEM SERVICES

Forests also provide a wide range of ecosystem services, which are the free service benefits humans derive from their surrounding ecosystems (Bolund and Hunhammar 1999). They are of important economic value, because without them, humans would have to economically provide for such services as filtered air and purified water (Phillips 2008). These services, on their own, would cost trillions of dollars for society to provide (Bolund and Hunhammar 1999). Forests provide large areas of leaf cover, which have positive effects on air quality (Bolund and Hunhammar 1999). Another service forests provide is their function as sound barriers, blocking noises near places such as highways (Bolund and Hunhammar 1999). Forests also serve an important function in storing carbon, helping to offset climate change (Loomis and Richardson 2001). If forestlands at the urban edge were removed, large and expensive projects would need to be initiated to reenact the positive effects of forests on the human environment. These free, ecosystem services given to us by forestlands represent assets that cannot be replaced.

2.4.5 ECONOMIC VALUE OF FORESTS

2.4.5.1 PROXIMITY VALUE

The proximity of people to forests was formerly an attraction of being close to natural resources, but now people come to areas high in natural amenities to be in proximity to a pleasant natural environment (McGranahan 1999). When given a choice of places to live, Americans prefer places with views of their natural surroundings (Kaplan and Austin 2004). This demand for viewing of the environment elevates the value and thus price of residential land adjacent to forested areas (Kaplan and Austin 2004). Many new residents of exurbia also state that one of their reasons for leaving an urban area for an exurban area is the proximity to natural settings such as forested lands (Kaplan and Austin 2004). The view of a forest or natural land is what affects property values the greatest on the urban-rural fringe (Kaplan and Austin 2004). The amount of forestland in an area not only affects the property with the forest, but also the value of the surrounding properties with the proximity values of natural amenities.

Aesthetics are also an important part to the proximity value of forests (Sheppard et. al. 2004). Usually when one evaluates the value of a forest, one uses socioeconomic and ecological criteria (Sheppard et. al. 2004). What these miss are the aesthetic values of forests that represent an important human value. Especially in exurban areas, forests are often used for the visual pleasure of residents and visitors, superseding the economic and environmental impacts that forestlands have (Sheppard et. al. 2004). When a forest is cut down or otherwise aesthetically damaged, the public takes issue with the lack of a view. The forests provide more than the environmental or economic benefits lost

(Sheppard et. al. 2004). The aesthetics of forests enhance the recreational desires and quality of life for a community, and in turn make a community more marketable for economic gains (Sheppard et. al. 2004).

2.4.5.2 TIMBER VALUE

The economic benefits of forestland are generally thought of through its timber value (Munroe and York 2003). Timber is seen as one of the many values that can come from forestland. In many areas with a high amount of forestland, such as Appalachia, the timber industry is still an important sector (Phillips 2008). For example, 7 percent of labor income in West Virginia still comes from forest products (Phillips 2008). Most of the benefits of the timber industry come from privately held forestlands and not from publicly held lands such as parks and National Forests (Phillips 2008). The timber industry can be seen as an alternative to other uses of forests (Munroe and York 2003).

2.4.5.3 RECREATION VALUE

There are also economic gains to leaving a piece of land that is forested undeveloped for human use through recreational uses. The economic gains of recreation on forestlands come from tourists participating in recreational activities, such as hiking, camping, and Off-Road Vehicle riding (McSweeney and McChesney 2004, Phillips 2008). Economic gain also comes from the purchase of lodging, recreational equipment, food, and other related expenses (McSweeney and McChesney 2004, Phillips 2008). These land uses offer the possibility of a fairly minor amount of environmental degradation and only require a small amount of input, yet have the possibility for

significant economic gains (Reeder and Brown 2005). Recreational opportunities can offer a boost to a regional economy that may no longer be able to use its forested lands for resource extraction, and yet do not wish for large scale development (Loomis and Richardson 2001, Phillips 2008).

2.4.6 CULTURAL VALUE OF FORESTS

Forests can also be seen as part of society's cultural heritage. A group of people's history and sense of identity can be linked with forests, giving cultural meaning to a natural setting (Selin et. al. 2004). Visiting a forest can give one a sense of what the past was like, and one may attempt to view their surrounding as past peoples did (Selin et. al. 2004). Some places have set up 'Heritage Areas' with the specific purpose of protecting an area's environmental sense of historical meaning (Selin et. al. 2004: pg 344). The official purpose of these Heritage Areas is to protect "the ongoing story of how the forest shapes history and culture, and how ecology and human use have shaped the forest" (Selin et. al. 2004). One such area, the Appalachian Forest Heritage Area in West Virginia and Maryland, is designed to preserve the history of human use of the forests that have sustained settlers of the area for centuries and provided raw materials for America's economy (Selin et al. 2004).

Forestlands, as a place, hold a valued place in the history of Western Thought (Hayman 2003, Harrison 1992). To Western Civilization, forests have long been the root of cultural imagination, representing the area just outside of the civilized realm (Harrison 1992). The relationships between forests and civilization have had a great impact on both the religious and secular parts of society, from the Roman's relationship with the

Germanic tribes to the legend of Robin Hood (Hayman 2003). Western Civilization has been seen as overcoming nature, having cleared away the mystery and wild with science and technology (Harrison 1992). Forests have been historically seen as outside of civilized jurisdiction, where outcasts, fugitives, and outlaws lived beyond the powers of society (Harrison 1992). The Christian culture began to see the forest as an area of anarchy, where the surviving beliefs of Paganism continued (Harrison 1992). These ideas about forests being on the outside of society continued through the European settlement of Appalachia, where the people of those forests were seen as outside of civilized America (Russ 2006).

2.4.7 FOREST OWNERSHIP

Land-use factors are often different depending on whether a forest is publicly owned or privately owned (Wear and Flamm 1993). Around 29% of forests in the United States are publicly owned (Smith et. al. 2002). The majority of public forestland is held in National Forests, which contain 19% of total US forestland (Smith et. al. 2002). The other 10% of public forestlands are owned by other federal agencies, state governments, counties, and local municipalities (Smith et. al. 2002). Most public forestlands in the US are found in Western States, with Eastern States dominated by private forestlands (Smith et. al. 2002). Public forests often have a broader goal for land-use than private forests (Wear and Flamm 1993). Forests in public lands are less influenced by market forces, and provide enhanced areas of biodiversity and sustain ecological health (Wear and Flamm 1993).

The other 71% of forestland is owned privately, with 13% being owned by industries, and 58% being Non-Industrial Private Forests (NIPF) (Smith et al 2002). In many areas of the US, NIPFs dominate the rural landscape (Bliss 2003). The amount of forestland in NIPFs is rising (Zhang et. al. 2005). Historically, NIPFs have been a large source for the US timber industry (Bliss 2003), but increasingly, NIPFs are being valued for the non-timber usage (Zhang et. al. 2005). The uses of NIPFs include residential uses, aesthetics, hunting, nature conservation, investment, and timber (Zhang et. al. 2005).

The amount of forestland in NIPFs can be problematic for forest management. With the increasing number of people owning NIPFs, the average size of each track of private forest is decreasing (Zhang et. al. 2005). Currently 96% of NIPFs are less than 100 acres in size, with 40% less than 10 acres in size (Zhang et. al. 2005). This parcelization causes a lack of coordination between the various forest owners (Zhang et. al. 2005). The problem with NIPFs being divided among a large number of owners is that forests do not stop at ownership borders (Wear and Flamm 1995), so parcelizaion could harm forests due to divided interests. Usage of private forestland is more motivated by market forests, which may not be in the best interest of the ecological health of an area (Wear and Flamm 1995).

2.5 TOURISM

2.5.1 INTRODUCTION

The rise of the tourism industry has brought economic change to many areas that formerly struggled economically. As an economic opportunity, tourism can be seen as a force of change. Tourism provides the economic incentive that gives value to forest tourism in exurban Appalachia. To many areas, the prospect of tourism provides a great opportunity economically where there were few economic possibilities before. This opportunity is built off of pre-existing draws of a region, which can be sold as a unique destination, making tourism a very unique type of economy. In times of changing economic conditions, tourism may prove to be the substitute that many communities are looking for after the decline of the natural resource extractive and manufacturing economies.

2.5.2 DEFINING TOURISM

There are a variety of ways that tourism can be defined. Tourism is a multi-faceted phenomenon, and its emergence has become one of the most remarkable economic and social occurrences of the past century (Cole 2007). Tourism can be seen as businesses that provide goods and services for the purposes of pleasure and leisure activities, which occur away from one's home environment (Moore et. al. 1995). Economically, tourism is seen as an industry capable of economically promoting both growth and local benefit because of its intensive use of local inputs and unskilled labor (Mansury and Hara 2007). Tourism can also be defined as a set of economic sectors, such as entertainment and recreation, accommodation and food services, amount of seasonal housing, and hotel business (Johnson and Beale 2002).

2.5.3 TOURIST MOTIVATIONS

There are many reasons that people choose to partake in tourism activities. One of the reasons that people become tourists is that they have the ability to do so (Moore et. al. 1995). There are many factors that go into this ability. They include high discretionary incomes that allow extra resources that can be spent on tourism (Cole 2007). With the retirement of the Baby Boomer generation, a new group of people have the time and desire for tourism (Johnson and Beale 2002). There are also an increased number of people who have the financial means to spend more money on travel due to changing economic demographics (Moore et. al. 1995). Other factors contributing to the increasing ability to travel include smaller family sizes, changing social demographics, lower transportation costs, and improved public health (Cole 2007).

The natural environment is often a draw when it comes to recreational tourism. Urban life is seen as full of restrictions on daily life, and creates a desire to leave urban areas to experience natural environments (McCool and Stankey 2001). The natural amenities that these areas provide attract tourists as well as seasonal residents (Reeder and Brown 2005). Uniqueness of an area and its surroundings are positive attributes when it comes to drawing tourists (Razak 2007). If a social meaning can be attached to the environment of an area, it can also be seen as a draw, because of the demand for authenticity and cultural heritage (Razak 2007).

Escapism is part of the experience of tourism. People travel to fulfill a personal need for the physical withdrawal from one's current location (Moore et. al. 1995). People are motivated to travel by their personal since of wanderlust, and need to abandon

the mundane (Moore et. al. 1995). These experiences are intended to create fun, relaxing, and pleasurable experiences (Moore et. al. 1995). People see an importance to vacations, because these experiences allow one to create stand-out experiences in their memory that will last past the moment of the experience (Moore et. al. 1995).

2.5.4 ACCESS AND TOURISM

Access is fundamental to establishing nature-based tourism (McCool and Stankey 2001). Recreation-based tourism cannot occur without the means to access the land that it takes place on (Williams 2001). The ability to access has several different dimensions. There is a political aspect to access, in which governments can regulate access to areas (Williams 2001). People generally support access to public lands, and the promise of access helps gain support for the creation of National Forests (Williams 2001). There is also a market-based dimension which creates the demand for public property to open to access (Williams 2001). The other dimension can be seen as cultural, with a level of trust opened up upon a community, for which access will follow with responsibility (Williams 2001).

There are also restrictive forces acting against access to recreation lands. There are groups that desire more restricted access to natural lands in order to ensure their environmental protection (McCool and Stankey 2001). Areas of nature must insure that there is a balance between the protection of the environment and the ability of tourists to access nature (Williams 2001). Ecosystems can be seen as having carrying capacities for tourism, after which too many tourists will harm an area (Williams 2001). Restrictions on recreational areas include limits on length of stays, limited areas of camping, allowing

only a certain number of people in an area, restricting technology, restrictions on means of travel such as boats and cars, and by issuing permits (McCool and Stankey 2001).

2.5.5 POSITIVE IMPACTS OF TOURISM

2.5.5.1 POSITIVE ECONOMIC FACTORS OF TOURISM

According to some measures, tourism is the world's number one export (Cole 2007). The growth of tourism as an industry has been rapid since World War Two (Cole 2007). Today, tourism is one of the largest and fastest growing industries (McDaniel 2000, Cole 2007). Tourism in the form of recreation is seen as a great success story of recent years (Reeder and Brown 2005). Much of this success is attributed to domestic tourism in developed countries, such as the United States (Cole 2007).

The growth of the tourism industry is ahead of many large economic sectors, such as manufacturing (Johnson and Beale 2002). Historically, manufacturing was seen as the most important industry in areas in which the tourism economy has now become prevalent (Cole 2007). Recreational tourism is replacing economies that used to dependent on agriculture, mining timber, and manufacturing (Johnson and Beale 2002). This is because tourism is providing an alternative to the declining manufacturing and natural resource economies (Alavalapati and Adamowicz 1999). For example, in areas once completely engulfed in the coal industry, tourism can finally be seen as an economic replacement (McDaniel 2001). The same is true of old industrial areas, which have found new use in turning rail lines into biking trails (McDaniel 2000).

Another positive aspect of tourism is that it is relatively easy to achieve as an economic alternative (Reeder and Brown 2005). A highly educated workforce is not needed for tourist activities, thus labor is easier to recruit (Reeder and Brown 2005). This labor is usually readily available within a local area (Alavalapati and Adamowicz 1999). New technologies are making the ability to create tourism economies simpler and easier than ever before (Cole 2007, Alavalapati and Adamowicz 1999). Also, only limited capital investment is necessary to start tourist-related facilities (McDaniel 2000, Alavalapati and Adamowicz 1999).

The creation of jobs in a local economy are also important positive impacts of tourism (McCool and Stankey 2001). Some communities rely on tourism to launch economic development (Reeder and Brown 2005). An increased demand for goods and services that tourism brings can create a more diversified economy (Reeder and Brown 2005). This can increase business revues throughout a community (McCool and Stankey 2001). These tourism-related jobs include hotels, restaurants, and other related service-orientated businesses (Reeder and Brown 2005). These economic effects can spill over into other economic sectors, such as airlines and housing, creating an overall improved local economy (Cole 2007, Reeder and Brown 2005).

2.5.5.2 POSITIVE SOCIAL IMPACTS OF TOURISM

The social factors of a region can also be improved in an area when tourism becomes an economic means (Reeder and Brown 2005). The well-being of people living in areas affected by tourism has been shown to improve on a number of levels. Because of the influx of jobs to an area, unemployment goes down (Reeder and Brown 2005).

With this, wage levels have the potential to rise, reducing the amount of poverty in a region (Reeder and Brown 2005). With the increase of wages and income, there is an increased ability to provide for one's health, thus levels of good health in an area improve (Reeder and Brown 2005). Educational attainment also is shown to improve in these areas (Reeder and Brown 2005).

2.5.6 NEGATIVE IMPACTS OF TOURISM

There are also negative impacts that tourism can have on an area. The increase in value of land creates an increase in housing costs for people living in the area (Reeder and Brown 2005). There is an increased pressure on local infrastructure, which increases with the increase of tourism (Reeder and Brown 2005, Cole 2007). Travel is an expensive venture. Large amounts of capital can be required to partake in certain forms of tourism (Moore et. al. 1995). Tourism could also be unstable for a community. The industry is responsive to variables from the environment and the outside economy which could make it vulnerable (Alavalapati and Adamowicz 1999).

In some situations, people of an area affected by tourism end up worse off then before the industry came into an area. Many of the jobs created are poor, with seasonal, unskilled, and low-wage labor making up most of the jobs in the tourism sector (Reeder and Brown 1995). With poor jobs, tourism has the ability to actually increase the amount of poverty in a region (Reeder and Brown 1995). Inequality may ensue in a region, because the tourism industry creates unequal gains for locals (Mansury and Hara 2007). The inability for all parts of a local community to fully participate in a tourist economy further creates this inequality (Mansury and Hara 2007).

2.5.7 ENVIRONMENTAL IMPACT OF TOURISM

In general, tourism is believed to be a 'green' industry when compared to previous economy means (Alavalapati and Adamowicz 1999). Sustainable forms of tourism attempt to minimize environmental impacts (McCool and Stankey 2001). With tourism, scenic landscapes are seen as valuable resources, and preserving the environment is seen as economical (Johnson and Beale 2002). Ecotourism is a fast-growing subfield of tourism that aims to reduce environmental impacts of tourism on the environment (McDaniel 2001). The success of this subfield is a positive signal for the future impact of tourism on the environment. In areas with tourism economies, there is a desire for environmental impacts to be low and for tourism to be peaceful (McDaniel 2000).

Still, tourism has the possibility to cause environmental damage. Attractive environmental features can be harmed by the impacts of tourism (Alavalapati and Adamowicz 1999). The added pressure of the tourist industry can bring added stress to vulnerable environmental ecosystems (Johnson and Beale 2002). The increase in infrastructure and public services needed to cater to the influx of tourists can cause harmful pollution (Reeder and Brown 2005). This pollution can help to spoil the very scenic views that give natural areas tourism values (Reeder and Brown 2005). This has caused some environmentalists to be critical of tourism as an economic means (Cole 2007).

2.5.8 RECREATION AS TOURISM

Tourism is utilized with recreation, by combining natural resources with human resources (McDaniel 2001). Recreational activities have long attracted large numbers of visitors to areas (Johnson and Beale 2002). Recreation as a type of tourism started in the 19th century, but has become a major industry within the last few decades (Johnson and Beale 2002). Recreation can include a wide variety of activities, creating many economic possibilities (Cole 2007). Recreational demands have grown due to the needs of people in urban and suburban areas to have places to experience the outdoors (Johnson and Beale 2002). Activities that are based around water and forests epitomize recreational opportunities (Johnson and Beale 2002). Growth of many recreational areas is due to their proximity near or within forests, making forests a key to recreational tourism (Johnson and Beale 2002).

2.6 CONCLUSION

The topics of exurbia, forests, and tourism area all needed to help determine whether forest tourism in exurbia can be a solution to the economic issues facing Appalachia today. These topics are all rooted in the changes brought about by the postindustrial economy. Through rough economic times, new opportunities have presented themselves as economic opportunities, which I attempting to analyze. By looking at the literature, one can see the broad impacts of these topics. The ability to transform in the wake of changing economic conditions helps unite these areas of study when it comes to this analysis. Each topic is needed for forest tourism in exurban Appalachia to occur. This analysis will attempt to expand to current literature with a new

perspective drawn from the attempt to solve the economic problems in postindustrial Appalachia.

CHAPTER 3

3 STUDY AREA

3.1 INTRODUCTION

Appalachia is a unique region of the United States in its history, geography, culture, and economy. The topography and urban structure of the region creates unique opportunities for tourism in Appalachia. The area has a history of poor economic conditions that give it a need for an economic alternative to resource extraction. This lack of recovery is due in part to the total dominance of previous industries over many towns. Company towns, where one business or industry employed the entire population, were common in Appalachia, and their demises left little remaining economy (Russ 2006). Tourism has shown the ability to improve overall socioeconomic conditions (Reeder and Brown 2005). The spillover effect has the potential to create growth in housing and businesses, and to make an area economically successful (Reeder and Brown 2005).

3.2 GEOLOGY

The Appalachian Mountains are some of the oldest mountains found on the planet (Encyclopedia Britannica 2008, Melikian 2001). The oldest of the crystalline rocks that the Appalachian Mountains contain were formed in the Precambrian eons, between 1.1 billion and 540 million years ago, through a series of violent eruptions. Later, in the Paleozoic era, new types of rocks were formed through sediments being deposited over time, between 360 and 286 million years ago (Encyclopedia Britannica 2008). The geologic processes that took place during this era created what are some of the richest coal beds in the world, along with other valuable resources such as iron, petroleum, and natural gas (Encyclopedia Britannica 2008, Melikian 2001). The resources formed during this time period were the result of the area being under a shallow sea, allowing animal life to be part of the sediment, unlike that of the older rocks which, due to the violence of their creation, contain no organic material, which is required to form resources such as coal (USGS 2004, Encyclopedia Britannica 2008). The natural abundances of nonrenewable resources that were created millions of years ago would later play a significant role in the human interaction with these mountains. The advanced age of the Appalachians can be seen in the paths of many of the rivers in the region, which cut through the ridges that formed after them, rather than forming around them (USGS 2004). Once the Appalachian Mountains initially formed, they reached great heights, such as that which are currently seen in the Himalayan Mountains (Redfern 1986). Over time, the mountains have been weathered down to their current stature, enabling the heavy amounts of forests which are found in today's Appalachia (NRI

1997). Geology has thus put into place the key pieces to human interaction today: forests and natural resources.

3.3 LOCATION

Appalachia is one of the oldest names on the maps of what we now call North America, coming from the early Spanish explorations of the region (Williams 2002). Yet, there is still much uncertainty regarding the spatial extent of Appalachia. An issue with studying Appalachia as a region is that it can be defined differently, depending on what is being measured. There are political, socioeconomic, and biophysical definitions of Appalachia that differ widely from each other, and can change an analysis based on how Appalachia is defined. This can create great problems with analyzing the area, because Appalachia has no agreed-upon boundaries (Williams 2002). The top subnational entity of the United States, the State, is not an acceptable level at which to define Appalachia (Williams 2002). This is because, except for West Virginia (Ulack and Raitz 1982), the region of Appalachia does not align with State boundaries; many States have sections that are considered Appalachia. For example, one cannot state that North Carolina, for example, is in Appalachia, because the political borders of that State were created centuries ago in England, and do not line up with geographic features, such as watersheds and mountain ranges, because State borders are political (Williams 2002).

The United States government, in defining the geographical scope of the Appalachian Regional Commission (ARC) (ARC 2008), was forced to confront the issue of the boundaries of Appalachia in 1964 (ARC 2008). The area of the ARC was chosen on a county-level basis in the states of Alabama, Georgia, Kentucky, Maryland, North

Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia, with a total then of 340 counties (ARC 2008). Over time this list has been added to, including counties in Mississippi, New York, and South Carolina, and the total number of counties now in the ARC is currently 410 (Figure A.1) (ARC 2008). This list is constantly being courted for updates by members of Congress. In 2007, had it passed, House Resolution 799 would have added 13 more counties to the ARC in Kentucky, Ohio, Tennessee, and Virginia (Library of Congress 2007).

Many believe that these politically designated boundaries for Appalachia are just that: political. Ignoring most aspects of topography, the ARC boundary is based primarily on socioeconomic similarities (Ulack and Raitz 1982). They were created with the idea of political compromise in mind, and therefore include areas not typically considered Appalachia, while ignoring others that clearly are. One example of this is the counties in Mississippi that are currently under the ARC's designation of Appalachia, even though they are lowland counties (Ulack and Raitz 1982, Willaims 2002). Another example of the political nature of the ARC boundary is that of the many mountainous counties in Virginia that are not in the ARC because their Congressman at the time opposed their Appalachian designation on philosophical grounds, thus creating a situation where the government does not consider them Appalachian now because of that (Williams 2002).

Another definition of Appalachia would be that of the Appalachian Mountain range. Even defining the bounds of the Appalachian Mountains can be a difficult task. Most generally, the Appalachian Mountains are considered to extend from the Gaspé Peninsula in Quebec, Canada to where it meets the gulf plains Alabama (Melikian 2001).

One of the often sited studies that defines geologic regions in the United States (Fenneman 1917) defines the geologic area of Appalachia, or the 'Appalachian Highlands', as a much larger area than that defined by political bounds such at that from the ARC. Fenneman put the eastern bounds of Appalachia farther east, including much of the northeastern United States, breaking the Appalachian Highland region into seven distant regions: Piedmont Province, Blue Ridge, Appalachian Valley, St Lawrence Valley, Appalachian Plateaus, New England Province, and the Adirondack Province (Fenneman 1917), which are then further defined into sub-regions.

Social definitions are also frequently used by people to determine where the bounds of Appalachia are. This definition is likely to be considerably different for those who believe they live in Appalachia, and those who live in a non-Appalachian region (Ulack and Raitz 1982). It is common for people define the region's bounds by social characteristics rather than geography. In the study by Ulack and Raitz, 'Poverty' was the most associated term used to define Appalachia. Other negative social factors such as 'Poorly Educated' (#3), 'Hillbilly' (#4), 'Moonshining' (#12), and 'Poor Housing" (#15), ranked high when used to describe Appalachia (Ulack and Raitz 1982). These negative associations are more likely to come from people living outside of Appalachia than people living in Appalachia (Ulack and Raitz 1982. The area that people perceive as being Appalachian is generally smaller than political or geological definitions, with people most associating Southern West Virginia, Western Virginia, and Eastern Kentucky with the area of Appalachia (Ulack and Raitz 1982).

3.4 CULTURE OF APPALACHIA

Appalachia has carved out a unique culture since European settlement began centuries ago. The isolation of the mountains has enabled the people of Appalachia to retain a unique identity in language, traditions, and religion (Russ 2006, Werbe 2007). The cultural descendents of today's Appalachia can be seen as the Scotch-Irish (Webb 2004). Most of these settlers in Appalachia migrated during the period of 1717-1775 (Russ 2006). Coming from the borderlands of Britain to the borderlands of America, Scotch-Irish retained their culture of isolationism, lack of trust in governments, and warrior spirit (Russ 2006). The place of Appalachians in the American social hierarchy remained the same as it did for their ancestors in Europe. The English notion of Scots and Scotch-Irish as being backwards and out of the mainstream helped influence how mainstream American culture has viewed the people of Appalachia and marginalized them economically and socially (Russ 2006, Blaustein 2003). For example, *redneck* was used in England to describe religious dissenters who belonged to the Presbyterian Church, of which many people in Northern England and Scotland belonged (Russ 2006).

Though the Scotch-Irish did not make up a majority of the population in most parts of Appalachia, other immigrant groups, such as the Germans, English, and Welsh, became absorbed in the Scotch-Irish culture, which was highly adaptable (Webb 2004). Not all of the people of Appalachia are of European decent. Despite popular notions, the people living in Appalachia are diverse, with around 12% of Appalachians being of non-European ancestry (Russ 2006). The majority of these are African Americans, who make up around 8.2% of Appalachians, while the small Hispanic minority is fast growing (Russ

2006). Most of the original Cherokee intermarried with early settlers, and many present day Appalachians have Cherokee ancestry (Russ 2006).

Religion plays a prominent part in Appalachian culture. The three largest denominations of churches in Appalachia are Baptists with 21%, Catholics with 13%, and Methodists with 9% (ARC 2008). Due to their independence and isolation, there is a wide variety of independent churches in Appalachia (Werbe 2007). This is in contrast to religious practices that take authority from a central figure (Russ 2006). Religious practices are very local in nature, and are considered part of the system of one's family and friends (Russ 2006). Many religious traditions that have adapted or died out over time continue on in Appalachia. Such practices as snake handling during religious services live on in the isolation of the Appalachian Mountains (Werbe 2007).

Overall, Appalachian culture forms a unique piece of America, rooted in isolationism and independence. The lack of direct contact with mainstream America allowed Appalachia to form a subculture with its own language dialects, music traditions, religious practices, and a respect for families and communities with distrust for outside authority (Russ 2006). This uniqueness gives a cultural meaning to the natural landscape of the area, and creates the potential for people to come to the area not only to experience Appalachia, but to also experience the Appalachian culture.

3.5 ECONOMY OF APPALACHIA

A major theme in the study of Appalachia is the region's economy. The Appalachian culture of distrust for the outside and the region's isolation have hindered economic opportunities for the region (Russ 2006). Isolation, both physically and

culturally, have separated Appalachia from the mainstream of American society. Although Appalachia is located in a prime position in relation to other parts of the US, the topography of the region keeps it isolated (Russ 2006). A large amount of the poverty in Appalachia is concentrated in rural areas, unlike other parts of the country (Sarnoff 2003). Appalachia has a history of informal economies outside of the normal economic systems (Sarnoff 2003), which further removes the Appalachian people from the US economy. This isolation and separation is not attractive to industry, making economic improvement in the region more difficult (Sarnoff 2003).

Renewable and nonrenewable natural resources have historically been the main source of wealth obtained from the Appalachian Mountains (Russ 2006). The most notable of these that has provided economic opportunities in the region are lumber and coal (Russ 2006, Sarnoff 2003). The height of these industries that made profits from extracting lumber and coal from Appalachia occurred in the last part of the 19th century and the first part of the 20th century (Sarnoff 2003). Outside businesspeople used this opportunity to buy up large amounts of land from naïve local landowners for far less than they were worth (Sarnoff 2003). These industries and their absentee owners then turned much of Appalachia into an economic caste system, where companies owned every aspect of life in many Appalachian towns (Russ 2006).

Coal continued to be a major force in the Appalachian economy well into the 20th century, going through a series of booms and busts. Coal was not the main economic base for the majority of Appalachian counties, but was heavily concentrated in a few dozen in which the industry made up over 10% of the economy (Black et. al. 2005). The last major boom for coal in Appalachia was during the OPEC oil crisis in the 1970s that

created a greater demand for energy (Black et. al. 2005). This created a coal boom that occurred from 1979 until 1977, and peeking from 1978 until 1982, after which has been in decline (Black et. al. 2005). Booms in the natural resource economy, such as coal, provided opportunities to increase wages and decrease poverty in counties affected, but often failed to bring long-term services and retail to rural areas (Black et. al. 2005). When the coal economy left a county, it was found to take away more jobs than it had originally brought in, making poverty and unemployment a great problem for Appalachia in the post-coal economy (Black et. al. 2005). By the early 1980's, the coal industry had changed for good. Technology had changed coal extraction processes, and areas of the Western US were now more favorable for the coal industry (Black et. al. 2005).

During the 20th century, manufacturing began to become a major part of the Appalachian economy (Jensen and Glasmeier 2001). From the 1960s, when recognition of Appalachia was sealed with the creation of the Appalachian Regional Commission, companies have seen Appalachia as a place with people willing to work for low wages and have a friendly business environment (Jensen and Glasmeier 2001). This created a time of economic development in manufacturing, particularly in branch plants of larger companies that are located outside of Appalachia (Jensen and Glasmeier 2001). About 75% of manufacturing jobs in Appalachia by the early 1990's were in branch plants, which is around 5% higher than the US average (Jensen and Glasmeier 2001). The branch plant economy soon became the cornerstone to the Appalachian economy, bringing jobs with steady wages to the area when it needed them. Wages in manufacturing were good for Appalachia compared to the previous economic sectors (Jensen and Glasmeier 2001).

The reliance on the manufacturing economy in the last half of the 20th century in Appalachia proved to be problematic. In the last 30 years, manufacturing has gone through dramatic changes (Jensen and Glasmeier 2001). Globalization and the changing of technology have restructured and resized the American Economy (Jensen and Glasmeier 2001). Since the late 1970's, there has been a decline in US manufacturing. Cheaper labor has been found abroad, replacing Appalachia as the place companies could turn to for cheap labor (Jensen and Glasmeier 2001). New technology decreased the need for location, and thus Appalachia lost its advantage close to US markets. Added to that, the manufacturing sector never provided Appalachians with the opportunity to move up to higher paying jobs (Jensen and Glasmeier 2001). Many rural areas were left unimproved throughout these economy changes (Jensen and Glasmeier 2001), and the added decline of the natural resource economy has made Appalachia's economy depressed.

Today, the only remaining aspects of the resource based economy are on a much larger scale, including strip mining and mountain top removal mining (Fraley 2007). These jobs are far more intensive at getting natural resources out of the mountains of Appalachia, and create a large amount of environmental damage (Sarnoff 2003, Fraley 2007). Some of the oldest mountains in the world are demolished and thrown into some of the oldest riverbeds in the world in search for the remaining amounts if coal left to extract in Appalachia (Fraley 2007). These processes have taken the level of environmental damage created by the economy to an extreme, continuing a process of 150 years of a natural resource based economy in Appalachia (Fraley 2007).

Where most of the lumber and coal industry has left, and where manufacturing has declined, poverty has taken its place. Poverty is seen throughout the length of the Appalachian Mountains. Northern Appalachia is a continuation of the Rustbelt that contains heavy manufacturing (Issermann and Repham 1995), and is home to closed factories; Central Appalachia is mountainous and isolated, home to the dying coal industry; Southern Appalachia is a land of exhausted agricultural areas (Issermann and Repham 1995). Poverty in recent years has been long-term and unmitigated, because for people of the region, there seems to be little escape do to the lack of economic advantages in the region (Sarnoff 2003). Some see this poor sector of the country as an 'internal colony' (Russ 2006) or America's example of a Third World Country (Gragson and Bolstad 2006). Since World War Two, large numbers of people from Appalachia have migrated out of the region to cities nearby where more jobs are available (Russ 2006). The out migration from Appalachia includes college graduates, who have more incentive to leave the region for better jobs, creating a 'brain drain' of educated people out of the region (Baumann and Reagan 2008). The continued need for economic alternatives to a resource based economy is a constant and pressing issue facing Appalachia.

3.6 FORESTS IN APPALACHIA

Appalachia is known for its richness in natural resources such as forestlands (Russ 2006). The current forests have a long history of human use, and still contain the scars of the destructive forces of humanity. Humans have been impacting the landscape of Appalachia since at least 8000 BCE (Gragson and Bolstad 2006). By the time of

European contact, the forests of Appalachia had been substantially transformed to vast areas of agriculture, and other parts were regularly burned or used for hunting grounds (Gragson and Bolstad 2006). By the mid 17th century, English traders had panned out across the region, carrying with them diseases that greatly reduced the Native American population if the region by the mid 18th century. This period of human depopulation allowed the forests of Appalachia to grow in the former agricultural lands (Gragson and Bolstad 2006). By the late 18th century, the forests had once again been clear and cultivated by the new European settlers (Gragson and Bolstad 2006).

The lumber and coal industries of the late 19th and early 20th centuries took a much greater toll on the forests of Appalachia that previous land uses. Much of Appalachia was depleted of forestland during this time period (Sarnoff 2003). After the forests were depleted, erosion washed away large parts of the fertile soil that could have supported agriculture in the region (Sarnoff 2003). During the last half of the 20th century, forests in Appalachia returned largely, due to the decline of the natural resources industries such as timber and coal (Gragson and Bolstad 2006). Forests are now found throughout Appalachia, with the average county in Appalachia now 54.3% forested (NRI 1997). The exception to this is areas affected by mountaintop removal mining. These areas are completely leveled of forestland and their topographic contour is altered, hindering future efforts at reforestation (Fraley 2007). The loss of potential land that could have been used for tourism is hard to gauge, because tourism was never given a chance to become an economic alternative in areas that have already been destroyed, but the potential loss of sustainable economic opportunities is enormous (Burns 2005). The

present amount of forestland in Appalachia is expected to remain constant, with agricultural abandonment off-setting exurban development (Gragson and Bolstad 2006).

3.7 TOURISM IN APPALACHIA

In recent decades, a push has been made for tourism in Appalachia. Outdoor recreation contributes $730 billion to the US economy annually, and Appalachia is attempting to tap into that economy for its benefit (Phillips 2008). The tourism industry now has a major impact on States that are in Appalachia, taking in billions of dollars annually (Johannsen 2004). It is becoming one of the largest sources of income for Appalachian States, such as Kentucky, where it is the third largest industry (Johannsen 2004), and in 'Wild and Wonderful' West Virginia, where it creates 61,000 jobs and $4.3 billion in sales (Phillips 2008). The tourism industry in Appalachia is mostly domestic, relying from visitors from nearby or from other parts of the United States (Johannsen 2004). The tourism industry in Appalachia benefits from its centrialized location in Eastern America (Russ 2006). It is within a relatively close distance for most Americans, and with increasing problem with airlines, it is seen as a close destination that can be reached by car (Sarnoff 2003).

Appalachia has both natural and cultural attractions that bring people in. People enjoy the uniqueness of the Appalachian culture. The music and crafts of the region are becoming fashionable (Sarnoff 2003). Bluegrass music, such as that featured in the popular movie *Oh Brother Where Art Thou*, is helping to draw tourists in to experience Appalachian cultural traditions (Sarnoff 2003). The history of the region is also used as a pull factor for tourists, using historic building and events reasons for people to visit a

region full of historic events (The Federal Reserve Bank of Cleveland 2002). Tourists also come to Appalachia to experience the natural beauty of the region (Johannsen 2004). Even though the forests are in a used and damaged state, people still come to Appalachia to explore the forests and rivers in a variety of forms of outdoor activities (Johannsen 2004). Though the stereotypes of the region still hinder the tourism industry (Fraley 2007), many see tourism as an economic alternative to previous economic means.

Tourism in Appalachia can come in a variety of forms. One popular type of activity is the riding of Off Road Vehicles (McSweeney and McChesney 2004). The riding of Off Road Vehicles requires a rugged landscape, of which the non pristine forestlands of Appalachia are an example of (McSweeney and McChesney 2004). This makes Appalachia an ideal place for this popular type of outdoor activity. Bicycling is another type of outdoor activity that thrives in Appalachia (McDaniel 2000). Appalachia is home to large areas of abandoned rail lines that cut through scenic areas, making them attractive places for bike riding. Tourism in Appalachia can also revolve around history, such as places associated with the Underground Railroad or historical downtowns in small towns (Federal Reserve Bank of Cleveland 2002). Hiking is a popular form of tourism in Appalachia, which allows people to view wildlife, natural views, and relax (Phillips 2008). Bird watching, horseback riding, and rafting are other recreational activities that take place in Appalachia (McSweeney and McChesney 2004). Each of these types of tourism benefits from a unique aspect of the forests of Appalachia, making tourism in Appalachia diverse.

Economically, tourism attempts to bring benefit to Appalachia. The economic gains brought about from tourism come from industries that cater to tourist needs. Many

of the jobs created are service sector jobs that require little in the ways of skills. Transportation jobs are needed to have the infrastructure to bring tourists in (Alavalapati and Adamowicz 1999). Once they are in an area, tourist need hotels and accommodations in order to have places to stay, requiring more jobs in these areas (Reeder and Brown 2005). The tourists also need places to eat, creating a demand for more restaurants (Reeder and Brown 2005). If people like an area enough due to its natural amenities, they may want to build vacation homes or move to an area, creating a demand for housing, creating construction jobs, which will lead to more jobs in all other sectors of the economy (Reeder and Brown 2005). It is through this spillover effect that tourism can be seen as a potential benefit to areas economically (Reeder and Brown 2005).

CHAPTER 4

4 METHODS

4.1 HYPOTHESES

In order to test the effects of forest tourism in exurban Appalachia, four hypotheses were created. Each of these hypotheses asks a different question, analyzing a particular angle to the issue of forest tourism. This analysis set out to test whether the problems facing Appalachia, the impacts of the series of economic changes that have brought about new realities, could be solved by the solution of tourism. Through the creation of models that use data related to each hypothesis, I attempted to measure if tourism through forests can be an economic alternative. Exurbia was also measured as a potential location for tourism opportunities. Potential solutions to the economic problems facing Appalachia can be studied with models created through these hypotheses.

These hypotheses were created to test whether forest tourism brought positive economic change to exurban Appalachia. The data represented in the models that test these hypotheses combine to give a complete picture of forest tourism in exurban Appalachia. The impacts of tourism were defined as its share of the economic base. We

want to know if more tourism in a county creates higher incomes, because if it does, it would support the theory that tourism is a positive economic alternative. Because much of Appalachia experiencing of rural poverty, we need to know how this is affecting the possibilities for tourism. In order to understand how tourism impacts exurbia, we need to know if tourism leads to increasing development, which could negatively affect the environment of an area. Also, in order to understand the possibilities of forest tourism, we must determine where in the urban gradient forests are.

This analysis examined the following hypotheses regarding the impact of forest tourism in exurban Appalachia:

1. Tourism will play a positive role in the economy. The positive impact will be measured through the rise of Per Capita Market Income with a rise in the tourism impact in a county. This hypothesis is being measured so that I could determine if tourism can be a viable economic alternative in Appalachia.
2. Tourism is affected negatively by rural poverty. This will measure if the presence of increasing poverty rates and increasing rurality has a negative affect on the tourism impact in a county. This is important because rural poverty is a persistent issue in Appalachia, and it must be taken into consideration when planning economic alternatives.
3. A tourist economy helps reduce rurality. This hypothesis will measure if a tourism economy encourages development, making places less rural. This will be measured by examining whether a tourism economy declines with an increase in rurality for a county. The issue of increasing development at the

urban edge is core to the study of exurbia, and if tourism causes development, environmental impacts could be felt as well.

4. Forests will decrease with the lack of rurality in an area. This hypothesis will analyze the land cover for the urban gradient of Appalachia, and how prominently forests are an urban land use. This will be determined by measuring the rise in rurality to the rise in the percentage of land forested for a county.

4.2 DATA

4.2.1 APPALACHIAN COUNTIES

In an analysis of the Appalachia region, the first parameter that must be set is the spatial extent of "Appalachia". As discussed in Chapter 3, defining Appalachia can be a problematic task because the region has no set boundaries. As mentioned in Chapter 3, Appalachia can be defined by political, socioeconomic, or biophysical means, and each of them comprises of a different set of counties. Determining the set of counties to study will affect the outcome of the analysis. If the counties are underbounded, missing counties that are important to the analysis will be left out, and cannot impact the results. If the area is overbounded, there will be too many unnecessary counties that will skew the results.

For this analysis, I used the definition provided by the Appalachian Regional Commission, which currently lists 410 counties as being part of the Appalachian Region (ARC 2008). A list of these counties was obtained from the Appalachian Regional

Commission. These counties are found in 13 U.S. states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia. This political definition was employed because in literature and data collection, the Appalachian Region is commonly defined by the boundary of the Appalachian Regional Commission. The Appalachian Regional Commission provides government data and reports on Appalachia as a region, thus data and analysis for Appalachia is most available for the region contained in the Appalachian Regional Commission.

The confines are defined by county boundaries for this definition of Appalachia. The issue with this is that measuring at the county level can cause a Modifiable Areal Unit Problem, because when aggregating for scale, data changes (Horner and Murray 2002). An ecological fallacy may result from assuming that all parcels within a county will show the same results as a county does (Kramer 1983). Whole counties are listed as part of Appalachia. Thus, this analysis incorporates counties as the unit of analysis, and data was collected at the county level. Measuring data at the county level can be problematic. Data aggregated to the county level can poorly capture land-use patterns (Theobald 2001). The sizes of US counties are inconsistent and vary tremendously (Lang and Sanchez 2006). Many counties cover various levels of the urban spectrum, because urban areas and land-use patterns do not fit neatly into county borders (Lang and Sanchez 2006). Thus, data will be used for this analysis at the county level because of its availability, but county level data is known to be problematic.

4.2.2 EXURBAN COUNTIES

For this analysis, a definition of which counties are considered exurban must also be made. Previous ways of defining exurbia were looked at in Chapter 2, and the types of data used to define exurbia were considered, such as population density, place in the urban spectrum, acres per residential piece of land, and the relationship to Core Based Statistical Areas. A new definition of exurbia was created to take into account both the population density of a county and its relationship with Core Based Statistical Areas. For the population density, a range of 40 to 325 persons per square mile was used. This represents a broad range of exurbia, and has been previously used in exurban analysis from the Ohio Exurban Change Program (Ohio Exurban Change Project 2008). For their project, this range was chosen to be in line with an average housing unit size of between 5 and 40 acres (Ohio Exurban Change Project 2008). For the Core Based Statistical Areas, counties that were either in a Metropolitan Statistical Area or a Micropolitan Statistical Area were used in this analysis. Thus, exurban counties in this analysis have a population density of between 40 and 325 persons per square mile and are in either a Metropolitan Statistical Area or a Micropolitan Statistical Area. With this definition, 193 out of the 410 Appalachian counties were categorized as exurban (Figure A.9, Table A.1, Table A.2, Table A.3, and Table A.4).

4.2.3 PERSONS PER SQUARE MILE

To obtain data for the aforementioned definition of exurbia, the variable of Persons per Square Mile had to be gathered (Figure A.5). These were collected for the

year 2000. The Appalachian Regional Commission obtained this variable by obtaining the 2000 census population and dividing it by the 2000 land area (ARC 2008).

4.2.4 CORE BASED STATISTICAL AREAS

Core Based Statistical Areas (CBSAs) consist of Metropolitan Statistical Areas and Micropolitan Statistical Areas (Figure A.6). They are defined by the U.S. Census Bureau, and are updated on a regular basis to reflect the current confines of a core-based area's region of influence and its commuting pattern. Metropolitan Statistical Areas contains an urban core of 50,000 people or more, and a Micropolitan Statistical Area contains an urban core of 10,000 people or more (U.S. Census Bureau 2008). CBSAs are measured in groups of counties. The year that the CBSAs were indicated in this analysis is 2003. The list of all U.S. counties and their 2003 CBSA, or lack of one, was downloaded from the U.S. Census Bureau (U.S. Census Bureau 2008). Information used from this data was the official name of the CBSA, and well as if it is a Metropolitan Statistical Area or a Micropolitan Statistical Area.

The population of each CBSA was gathered for use in this analysis as well. A separate data set was obtained from the U.S. Census Bureau with the population of each CBSA. The year of this data was 2006. This should not pose any significant issues with the CBSA definition of 2003, since there have been very few changes in the bounds of the CBSA in the three years between the two data sets. The population of each CBSA was matched up with a database with each county in Appalachia and its. Thus, each county was then identified with the total population of the CBSA it is in. The total population of each county was also calculated, but the total populations of Core Based

Statistical Areas seem to correlate more with the study of tourism's impact, since counties are confined into limited spaces. CBSA populations indicated the number of people living in an area of urban influence, thus are more useful than a county's population, because this indicator shows all the people who have interaction with an area by it being part of a CBSA.

4.2.5 RURALITY

After considering several ways to define rurality, as discussed in Chapter 2, the Index of Relative Rurality (IRR) was chosen to be used for this analysis (Figure A.7). This index indicates the amount of rurality in numerical form, ranging from 0 to 1, but does not indicate what part of the urban gradient a county is in. Data on the IRR for each county was gathered from the Indiana Business Research Center, and measured for the year 2000. It was downloaded state by state in Microsoft Excel. Then, for each county, the VLOOKUP function was used to add the IRR value to the previous data. With the calculation of the more precise Index of Relative Rurality, the Urban Influence Code was not as useful to the analysis. It is limited because it gives twelve general categories to which all counties are fit into, instead of a numerical range.

4.2.6 PER CAPITA MARKET INCOME

Per Capita Market Income is an indicator of economic success of an area, and thus is used for such an indicator for this analysis (Figure A.2). Per Capita Market Income data was obtained through the Appalachian Regional Commission. The data is for the year 2002, and was calculated by dividing total personal income, less transfer

payments, by population (ARC 2008). Transfer payments are unearned benefits, such as disability and unemployment, which are examples of unearned income. Per Capita Market Income, as an average for people living in a county, does not take into account how evenly income is distributed across the income scale. Poverty Rate does measure the amount of people living in the lowest income brackets, and is included as another variable. The economic status, which measured the level of economic distress a county is under, was also calculated for all of the counties. The problem with this measure is that there are too few categories (five) for much to be read into the distress of a county, and thus the impact of this variable was not significant and it was not used.

4.2.7 POVERTY RATE

The Poverty Rate can be used as an alternative to Per Capita Market Income when measuring the economic success of a region, because it measures the percentage of people living below the poverty line, and not an average income for all people. With this, the Poverty Rate shows income distribution. This data was also obtained from the Appalachian Regional Commission, and was measured for the year 2000. The Poverty Rate derived from dividing the number of people living below the poverty line by the total number of people for which a poverty status has been determined (ARC 2008).

4.2.8 PERCENT FORESTED

One variable that was needed for this analysis was the percentage of each county that is forested (Figure A.3). County-level databases of forest cover proved difficult to obtain. The National Forest Service has a county level database, but forest

cover there is measured by accessible forests, whereas this analysis requires a complete listing of forest cover. The database that was used in this analysis was the National Resource Inventory (NRI) database. The latest data for NRI is from 1997. This database is a series of sample points, each containing land-cover data. Each point is representative of a larger area, and includes a multiplier so one knows how much area that point represents. The points were converted to area by using the multipliers provided. County names were identified through the use of FIPS codes, by matching the data to a database of all FIPS codes (U.S. Census Bureau 2008). To use this database for this analysis, land cover for the categories 'grazed forest' and 'ungrazed forest' were combined, to get a total forest estimate for each county. Then, this sum was divided by the total area of each county, to get the percent forested of each county. The National Forest Service provides data on forests, but categorizes it as Accessible Forest Land.

Accessible Forest Land is classified as that which can be safely visited and meets certain tree-stocking criteria (Figure A.4) (National Forest Service 2002). This data was matched up to the database, but was considered not as useful as a database of all forestland. A measure of all forestland more accurately judges the potential of forest tourism of an area, while accessible forestland can only make assumptions about the present, since more forestlands could become accessible in the future. Accessible forest data does not give the full potential for a county, because it is underbounding the areas to which future tourism in forests could occur. The measure of Accessible Forest Land may provide a valuable resource for future research.

4.2.9 TOURISM

Tourism data was a vital part of this research. Defining tourism is not straightforward, as discussed in Chapter 2. The main sources for economic data are the Census Bureau, the Bureau of Labor Statistics, and the Bureau of Economic Analysis (Cortright and Reamer 1998). The Bureau of Economic Analysis has the categories of 'Entertainment and Recreation' and 'Accommodations and Food Services', which have previously been used to categorize tourism (Johnson and Beale 2002). Thus, for the purposes of this analysis, tourism was measured by combining the aforementioned Bureau of Economic Analysis categories into a tourism sum. The Bureau of Economic Analysis (BEA) is part of the Department of Commerce, and produces large and complex datasets that cover a wide view of economic sectors (Cortright and Reamer 1998). The BEA covers compensative income and employment data. Thus, data was gathered for each county in Appalachia for the BEA categories of 'Entertainment and Recreation' and 'Accommodations and Food Services' to create a tourism sum.

To use this measure to analyze the impact of tourism on a local economy, the Location Quotient (LQ), as described in Chapter 2, was calculated for the impact of tourism in each county (Figure A.8). This impact shows the impact of the economic groups of 'Entertainment and Recreation' and 'Accommodations and Food Services', and the LQ measures their contribution on the larger economy (Cortright and Reamer 1998). The impact was measured in worker compensation, in dollars that were paid to workers in the BEA categories of 'Entertainment and Recreation' and 'Accommodations and Food Services'. This was done to aggregate for low or high wage jobs that would not be measured in raw numbers of people working in each industry. The compensation to

people in the tourism industry was measured against total compensation in a county to determine the impact. Then, the percentage of each county's economy, as measured by income compensation, was divided by the same measure nationally. This gave each county an LQ as measured against the US economy, thus measuring the tourism impact in each county in Appalachia versus the average tourism impact in the whole United States.

The LQ was calculated for the measure of tourism versus the State each county in Appalachia lays in, and against Appalachia as a whole region as well. The US tourism LQ was used instead of the State tourism LQ or the Appalachian tourism LQ because this analysis compared tourism in Appalachia as it is situated in the United States. Each state has a different impact for state-wide tourism, thus the State LQ would not have been a constant measure. The measure of Appalachian tourism LQ would have skewed the results based on how the county compared to other similar counties, thus not giving the whole picture of the impact tourism is having in each county.

4.2.10 OUTLIERS

When calculating the data, variables can be plotted against each other using the scatter plot function. The scatter plot is a type of exploratory analysis which can illustrate linear and non linear relationships among data, and is a basic check for quality control (Utts 2005). Also, outliers can be seen in the data from a scatter plot, which differs greatly from the rest of the results. The variable that produced the most noticeable outliers was the Location Quotient. The average US Tourism value is '1' for this variable, and there were three counties with a value above 4, meaning they had more than

more times the average impact of tourism on their economy. Sevier County, Tennessee has a Tourism LQ of 7.05, meaning that is has over 7 times the average impact of tourism. Sevier County is known as the Gateway to the Great Smoky Mountains National Park, and home to Gatlinburg and Pigeon Forge (Sevier County Economic Development Corporation 2008). Nearly 10 million people visit Sevier County annually (Sevier County Economic Development Corporation 2008), making the tourism impact off the charts compared to other counties in Appalachia.

The next highest outlier is Pocahontas County, West Virginia, with a US Tourism LQ of 5.60. Pocahontas County markets itself as 'Nature's Mountain Playground" (Pocahontas County Convention and Visitors Bureau). One out of every four jobs in the county is tourism, and its scenic trails and highways attract over 1 million visitors per year (Pocahontas County Convention and Visitors Bureau). The impact on the economy appears enhanced due to the very small population of the county, at around 9,000 people (Pocahontas County Convention and Visitors Bureau). The other major outlier is Greenbrier County, West Virginia, with a US Tourism LQ of 4.14. It is home to the famous Greenbrier Resort, and promotes its tourism with the slogan "Far Enough Away…So Close to Home" (Greenbrier County Convention and Visitors Bureau).

4.3 METHODS OF ANALYSIS

4.3.1 SETUP FOR ANALYSIS

All of the data that was gathered was put into a master database of variables for each county in Appalachia, which contains a total of 410 counties. Counties that did not

have economic data available to the public were excluded from the analysis. There were 76 counties with insufficient economic data, 9 of which were classified as exurban. Of the 334 total counties with data, 184 of those were exurban, 125 of those were rural, and 25 were urban. The final databases used the variables Counties, Index of Relative Rurality, Per Capita Market Income, Poverty Rate, Percentage Forested, CBSA, CBSA population, persons per square mile, and the US Tourism LQ.

Once in an analysis program, models were needed in order to test the hypotheses for this analysis. In order to test the effects of exurbia on the given variables, dummy variables for each level of rurality were created, one each for rural, exurban, and urban. Each dummy variable was valued at '1' for a county that was in that level of rurality, with no county being part of more than more than one level of rurality. To determine whether the relationships among the dependent and independent variables varied across the urban spectrum, dummy variables were created to show the interaction effect. These show the value of a variable just for a certain level of rurality by multiplying a dummy variable by an existing variable. For example, the interactive effect variable can be created for exurban rurality by multiplying the exurban dummy variable by the IRR variable, so that just the exurban IRR values are shown.

In each model, area dummies and interaction effects were included to test whether there were statistically reliable differences on average and in the relationships with covariates between exurban and rural, and exurban and urban counties, respectively. Exurbia needed to be compared to rural areas and urban areas separately, because rural areas and urban areas are different, with different types of land use and economic bases. Comparing exurbia to rural areas and urban areas together would fail to tell the whole

story. In order to make the separate comparisons, each model had to be run twice, once for exurban and rural, and once for exurban and urban. To do this, the non-used level of rurality had to be filtered out using the dummy variables, creating two data sets, with one showing rural and exurban, and the other showing exurban and urban. After the data was set, a linear regression was used to test each of the models. For each hypothesis, a dependent variable was compared against a set of independent variables, along with the exurban dummy variable and the exurban interactive effect variable or variables.

Four sets of models were created from the four hypotheses. Each model sets out to analyze a different dimension of the forest tourism in exurban Appalachia. The first set of models will examine if tourism really is a positive economic force, by measuring if it is associated with higher incomes. The second set of models measure if rural poverty, a persistent negative factor in Appalachia, is holding back a tourism economy. The third set of models examines whether tourism is another factor associated with exurban development and urban decentralization. The fourth set of models look at how the changing urban gradient affects forest cover, and the social and environmental values that go with it.

4.3.2 MODEL 1

For the Hypothesis 1, I created a model to examine whether tourism plays a positive role in the economy. For an indicator of the economy, Per Capita Market Income was used as the dependent variable. The model for Hypothesis 1 contained the independent variables of Index of Relative Rurality, CBSA population, Percent Forested, and the US Tourism LQ. The U.S. Tourism LQ was the covariate used to test Hypothesis

1. This model also included the exurban dummy variable and the U.S. Tourism LQ interaction effect variable for exurbia, to test for significant differences within exurban areas.

4.3.3 MODEL 2

Hypothesis 2 set out to determine if tourism is affected by rural poverty in a county. The dependent variable I used was the US Tourism LQ, which is measuring the impact of tourism on a county's economy, as compared with the United States. The independent variables used were the Index of Relative Rurality, the CBSA population, the Percent Forested, and the Poverty Rate. The Poverty rate and Index of Relative Rurality were included as covariates in order to assess Hypothesis 2. This model also included the dummy variable for exurbia, as well as the interaction effect variables for exurbia for the Index of Relative Rurality and the Poverty Rate.

4.3.4 MODEL 3

For Hypothesis 3, a model is created to determine the association between a tourist economy and rurality. If tourism helps reduce rurality, it can further promote urban decentralization. The dependent variable for this model was the Index of Relative Rurality, measuring how rural a county is. The independent variables that best fit the model were the US Tourism LQ, the Percent Forested, and the Per Capita Market Income. The US Tourism LQ was especially paid attention to with regards to its significance versus the Index of Relative Rurality to prove Hypothesis 3. This model

also included the dummy variable for exurbia, as well as the interaction effect for US Tourism LQ for exurbia.

4.3.5 MODEL 4

For Hypothesis 4, a model was created to estimate whether forestland would decrease with the lack of rurality in an area. The dependent variable in this case is the Percent Forested, which measures what percentage of a county's land-cover consists of forestland. The independent variables were the US Tourism LQ, the CBSA population, and the Index of Relative Rurality. For this model, the Index of Relative Rurality was looked at in regards to its significance versus the Index of Relative Rurality to prove Hypothesis 4. The dummy variable for exurbia was also included in this model, as well has the interaction effect for the Index of Relative Rurality for exurbia.

Model	Rural Gradient Measured	Dependent Variable	Independent Variables
Model 1	Model 1.1: rural and exurban Model 1.2: exurban and urban	Per Capita Market Income	Index of Relative Rurality, CBSA population, Percent Forested, US Tourism LQ.
Model 2	Model 2.1: rural and exurban Model 2.2: exurban and urban	US Tourism LQ	Index of Relative Rurality, the CBSA population, the Percent Forested, and the Poverty Rate
Model 3	Model 3.1: rural and exurban Model 3.2: exurban and urban	Index of Relative Rurality	US Tourism LQ, the Percent Forested, and the Per Capita Market Income
Model 4	Model 4.1: rural and exurban Model 4.2: exurban and urban	Percent Forested	US Tourism LQ, the CBSA population, and the Index of Relative Rurality

Table 4.1: Model Summary

CHAPTER 5

5 RESULTS AND DISCUSSION

5.1 INTRODUCTION TO THE MODELS

To answers the Hypotheses from Chapter 4, the models, also outlined in Chapter 4, were estimated. SPSS software was used to analyze these models. The models were expected to indicate if there is support for the hypotheses, and to show which variables are the most influential in the various models. From running these models, a further knowledge of the processes that influence forest tourism in exurban Appalachia was expected.

5.2 MODEL 1

Variable	B	Std Error	Significance
IRR	-12164.26	2220.29	0.00
CBSA Population / 10,000	4.89	1.16	0.00
Percentage Forested	-35.49	12.50	0.01
US Tourism LQ	1125.99	1620.75	0.49
Exurban Dummy Variable	2980.12	1637.61	0.07
US Tourism LQ interactive effect for Exurban	-876.79	1648.54	0.59

Dependent Variable = Per Capita Market Income

R Squared = 0.329

Dependent Variable: Per Capita Market Income

Table 5.1: Model 1.1

The Impacts on the Economy for Rural and Exurban Appalachia

Variable	B	Std Error	Significance
IRR	13796.39	2215.95	0.00
CBSA Population / 10,000	5.76	1.12	0.00
Percentage Forested	-29.22	12.37	0.02
US Tourism LQ	-1887.42	1191.94	0.12
Exurban Dummy Variable	-3781.03	1439.34	0.01
US Tourism LQ interactive effect for Exurban	2079.71	1239.74	0.10

Dependent Variable = Per Capita Market Income

R Squared = 0.448

Dependent Variable: Per Capita Market Income

Figure 5.2: Model 1.2

The Impacts on the Economy for Exurban and Urban Appalachia

5.2.1 DISCUSSION OF MODEL 1

The hypothesis tested for Model 1 was that tourism will play a positive role in the economy. This model was created because tourism is becoming an economic alternative in parts of Appalachia, replacing former economies that were based around natural resource extraction and manufacturing. Is this new economic base in Appalachia benefiting the people economically? Per Capita Market Income was regressed against the

US Tourism Location Quotient. Thus, this model tests whether an increase in the impact of tourism on an economy increases the income of the people.

In Model 1.1 the impacts on income were measured for rural and exurban counties. The model has an R squared of 0.329, meaning that 32.9% of the change in income is explained by the variables in the model. The Index of Relative Rurality was shown to be very significantly associated with income, with a rise in rurality decreasing income. Forest cover was also shown to be significant, with a rise in forest cover resulting in a decrease in income. The US Tourism LQ was not shown to be significant, due to a high standard error. Despite insignificance, by examining the sign of the effect, some interesting potential patterns emerge. For the overall database of rural and exurban counties, tourism in a county raises the income of people in that county. From the interaction effect, it appears that tourism in exurban counties raises income far less that in rural counties. The exurban dummy variable shows that income is higher in exurban areas than in rural areas, though neither effect was significant.

For Model 1.2, the impacts on income were measured for exurban and urban counties. The R-squared of the model is 0.448, meaning that 44.8% of the change in income is explained by the variables in the model. Like Model 1.1, rurality is shown to be a highly significant variable, and an increase in rurality is shown to cause a decrease in income. Similarly, forest cover is also shown to be significant, with an increase in forest cover decreasing income for a county. The exurban dummy variable was found to be significant, with exurbanites earning less than people in urban counties. The tourism variables are closer to being significant in this model than for Model 1.1. For the database including both exurban and urban counties, an increase in tourism causes a

decrease in income. The interaction variable shows that this is not the case in exurban areas, where tourism increases income. It seems that tourism adds more value to the economy as one moves farther from the center of a metropolitan area, with tourism having a negative effect on income in urban areas, a positive effect in exurban areas, and an even greater positive effect in rural areas of Appalachia. It seems that trends are leaning towards proving Hypothesis 1, but the data is not at a significant enough level.

5.3 MODEL 2

Variable	B	Std Error	Significance
IRR	-4.56	4.95	0.36
CBSA Population / 10,000	0.00	0.00	0.00
Percentage Forested	-0.01	0.00	0.02
Poverty Rate	-0.01	0.03	0.67
Exurban Dummy Variable	-3.00	3.04	0.33
IRR interactive effect for exurbia	4.44	4.98	0.37
Poverty interactive effect for exurbia	0.01	0.04	0.74

Dependent Variable = US Tourism LQ

R Squared = 0.120

Dependent Variable: US Tourism Location Quotient

Figure 5.3: Model 2.1

Impacts on Tourism for Rural and Exurban Appalachia

Variable	B	Std Error	Significance
IRR	2.69	2.03	0.19
CBSA Population / 10,000	0.00	0.00	0.00
Percentage Forested	-0.01	0.00	0.10
Poverty Rate	0.05	0.04	0.23
Exurban Dummy Variable	1.29	0.72	0.08
IRR interactive effect exurban	-2.85	2.09	0.18
Poverty interactive effect exurban	-0.05	0.04	0.20

Dependent Variable = US Tourism LQ

R Squared = 0.108

Dependent Variable: US Tourism Location Quotient

Figure 5.4: Model 2.2

Impacts on Tourism for Exurban and Urban Appalachia

5.3.1 DISCUSSION OF MODEL 2

The Hypothesis tested for Model 2 was that tourism is affected negatively by rural poverty. This model was created because of the economic nature of Appalachia. Rural

poverty has been seen as a persistent problem in Appalachia, and it became worse with the job losses following the decline and the natural resource extraction and manufacturing industries. This model tests if this persistence of rural poverty hurts a county's chances of creating a tourism-based economy because people of an area are isolated and impoverished, or if it helps an area due to cheap and willing labor. To measure rural poverty, the Index of Relative Rurality and the Poverty Rate were measured against the US Tourism Location Quotient.

First, the impact of rural poverty was measured for rural and exurban counties in Model 2.1. The model has an R squared value of 0.120, meaning that only 12 percent of the variation of the US Tourism LQ is determined by the variables in the model. The CBSA population of a county has a significance level of 0.000, making it very significant. The amount of tourism increased with the amount of people living in a CBSA. The Percent Forested also has a good significance level at 0.022, with the increase in forest cover slightly decreasing the tourism in a county. The remainder of the variables were not within the 0.05 significance level, but do show us trends. When looking at the exurban dummy variable, one can see that tourism is more important in rural counties than exurban counties. Even though they are not measured as being significant, the interaction effects can tell us some trends. It appears that, when looking at rurality, tourism decreases as a county gets more rural for the database of rural and exurban counties. When accounted for, the interaction effect nearly wipes away the negative effect of rurality for exurbia, but it still has a slight negative effect on tourism. When looking at poverty, the trends follow the rurality. As poverty rises in a county, the rural and exurban database shows a decrease in tourism. By looking at the interactive

effect, one can see that a rise in poverty has much less of an impact on tourism in exurbia, with it only slightly decreasing with a rise in poverty.

In Model 2.2, exurbia is compared to urban counties. The model has an R squared value of 0.018, meaning that only 10.8% of the difference in the US Tourism LQ is explained by the variables. The only variable with a significance level of less that 0.05 was the CBSA population, in which tourism in a county increased with a rise of CBSA population. The forest cover variable was near significant, with the amount of forest cover decreasing tourism as it did in model 2.1. For the dummy variable for exurbia, it was shown, at an insignificant level, that tourism is more important in exurbia than urban areas. For rurality, the model shows that increasing rurality increases tourism for the database of exurban and urban counties. This effect was different in exurbia, as shown by the interactive variable for exurbia. An increase in rurality slightly decreases tourism in exurbia. For poverty, though at an insignificant level, an increase in poverty in exurban and urban counties shows in increase in tourism. But, when looking at the interactive effect, one sees that increasing poverty decreases tourism in exurbia, thus the gains for tourism with an increase in poverty come from urban areas. These models show that rural poverty is more of a negative factor for tourism the farther out one goes in the urban spectrum. The data trends towards proving Hypothesis 2, but is not at a significant level.

5.4 MODEL 3

Variable	B	Std Error	Significance
US Tourism LQ	0.02	0.01	0.10
Percentage Forested	0.00	0.00	0.49
Per Capita Market Income	8.63 E-6	0.00	0.00
US Tourism LQ interactive effect for Exurbia	-0.01	0.01	0.51
Exurbia Dummy Variable	-0.12	0.02	0.00

Dependent Variable = IRR

R Squared = 0.547

Dependent Variable: Index of Relative Rurality

Figure 5.5: Model 3.1

Impacts on Rurality for Rural and Exurban Appalachia

Variable	B	Std Error	Significance
US Tourism LQ	0.02	0.04	0.68
Percentage Forested	0.00	0.00	0.31
Per Capita Market Income	-9.91E-06	0.00	0.00
US Tourism LQ interactive effect for Exurbia	-0.01	0.04	0.87
Exurbia Dummy Variable	0.14	0.04	0.00

Dependent Variable = IRR

R Squares = 0.449

Dependent Variable: Index of Relative Rurality

Figure 5.6: Model 3.2

Impacts on Rurality for Exurban and Urban Appalachia

5.4.1 DISCUSSION OF MODEL 3

The Hypothesis tested for Model 3 was that a tourist economy helps reduce rurality. This hypothesis sets to determine if a tourist economy can lead to exurbanization, by decreasing how rural a county is. Exurbanization is a growing trend in both Appalachia and the US as a whole. Many processes related to the new economy

help spawn this process. Is tourism one of them? This model uses the US Tourism LQ measured against the Index of Relative Rurality to help determine this.

Model 3.1 shows the impact of tourism on rurality for rural and exurban counties. The model has an R squared value of 0.547, meaning that 54.7% of the difference in rurality is explained by the variables in the model. Per Capita Market Income was shown to have a strong significance with rurality, with a significance level of 0.000. It as shown that as Per Capita Market Income increased, rurality decreased. Thus, the less rural a county is, the higher the income of people there. The exurban dummy variable was shown to be very significant in accordance to rurality, as expected, with rural areas have more rurality than exurban areas. Though not completely significant, we can still look at the impact of tourism on rurality. For the database that includes both rural and exurban areas, tourism was shown to rise with rurality. But, by looking at the interaction effect, we see that tourism has less of an impact on rurality in exurban areas as it does in rural areas, with rurality rising less with the rise of tourism in exurban areas.

Model 3.2 shows the impact of tourism on rurality for exurban and urban areas. The R squared for this model is 0.449, which means that only 44.9 % of the difference in rurality is explaned by the variables. The variable measuring Per Capita Market Income was, similar to model 3.1, strongly coordinated to rurality, with income decreasing with a rise in rurality. The exurban dummy variable was also very significant, since exurbia is a category of rurality. The tourism variables were not very significant, but one can still look and see what their impact is shown as. The increase in tourism showed an increase in rurality for the database of exurban and urban counties. When the interaction factor for exurbia is looked at, it shows that the impact of tourism on rurality is less for exurbia

than it is for urban areas, with rurality increasing less with tourism than in urban areas. Tourism seems to rise with rurality more in both urban and rural areas than in exurban areas. Thus, we cannot prove Hypothesis 3.

5.5 MODEL 4

Variable	B	Std Error	Significance
US Tourism LQ	-5.00	1.89	0.01
IRR	110.99	126.91	0.38
CBSA Population / 10,000	0.02	0.01	0.03
IRR interactive effect Exurban	-91.30	127.54	0.48
Exurban Dummy Variable	54.27	79.95	0.50

Dependent Variable = Percent Forested

R Squared = 0.078

Dependent Variable: Percent Forested

Figure 5.7: Model 4.1

Impacts on Forest Cover for Rural and Exurban Appalachia

Variable	B	Std Error	Significance
US Tourism LQ	-3.11	1.80	0.09
IRR	-1.60	52.28	0.98
CBSA Population / 10,000	0.01	0.01	0.07
IRR interactive effect Exurban	22.23	53.87	0.68
Exurban Dummy Variable	3.65	13.91	0.79

Dependent Variable = Percent Forested

R Squared = 0.102

Dependent Variable: Percent Forested

Figure 5.8: Model 4.2

Impacts on Forest Cover for Exurban and Urban Appalachia

5.5.1 DISCUSSION OF MODEL 4

The Hypothesis tested for model 4 was that forests will decrease with the lack of rurality in an area. This model is attempting to show where forests are located on the urban spectrum. By this, one can see where the greater tourism potential lies in terms of forest tourism. One expects that forests are found in greater numbers the more rural an area is. This could show how exurbia could benefit for forest tourism, if there are more forests to be found in exurban areas. Forest cover was measured by the percentage of a county that had forests on it, and rurality was measured by the Index of Relative Rurality.

For Model 4.1, the impacts on forest cover are shown for rural and exurban counties. The R squared value for Model 4.1 is 0.078, meaning that only 7.8% of the variance in forest cover is explained by the variables in the model. The tourism was found to be a significant variable when it comes to forest cover, with an increase in tourism in a county decreasing forest cover. The population of the CBSA a county is a significant variable, with forest cover slightly rising with a rise in CBSA population. Even though the other variables were not shown to be significant, one can see trends in the variables. For the exurban dummy variable, it shows that there are more forests in exurban areas than rural areas, but at an insignificant level. For the relationship between rurality and forest cover, the model shows that a rise in rurality of a county is related to a rise in forest over. The interaction effect shows that the rise in forest cover due to the rise in rurality is far less in exurban areas than in rural areas.

Model 4.2 shows the impacts on forest cover are shown for exurban and urban areas. The value of the R squared is 0.102, meaning that only 10.2% of the change in forest cover is explained by the variables in the model. In this model, none of the variables were shown to be significant at the 0.05 level. The most significant variables were shown to be the CBSA population and tourism. The percentage of forest cover was shown to increase with an increase in population for a CBSA a county is in, and decrease with an increased impact of tourism. Though insignificant, the exurban dummy variable showed a trend towards more forest cover in exurban areas than urban areas. The rurality variables were very insignificant. The trend for the database containing exurban and urban land cover showed that forest cover decreases with an increase in rurality. The interaction effect showed that in exurbia, forest cover increases with rurality. But, due to

the large amount of insignificance, one could say forest cover is not determined by rurality in Appalachia, and Hypothesis 4 cannot be proved.

5.6 EXPLORATORY DATA ANALYSIS

Scatter plots were used to analyze the variables that were used against each other. Many of the scatter plots showed the influence of outliers on the data results. Particularly in tourism, as mentioned in Chapter 4, there are large outliers that stand apart from the remainder of the data. There were left in because these sites of tourism are of great importance to tourism in Appalachia, and thus taking them out would present an incomplete picture of the situation.

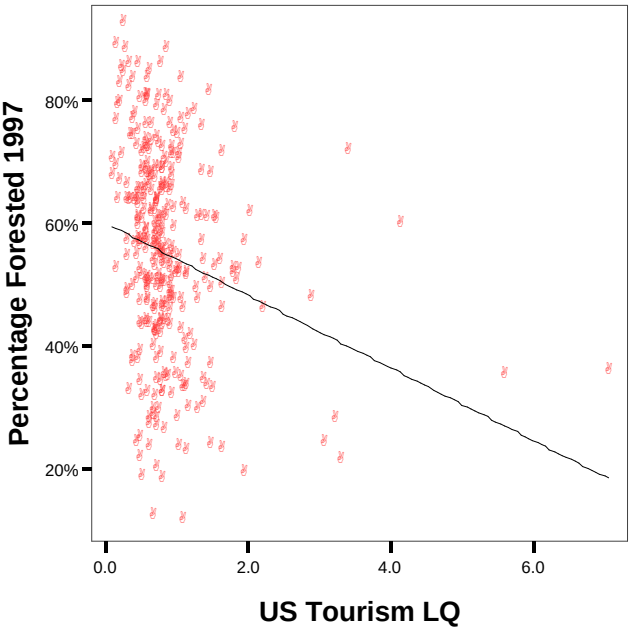

Figure 5.9: Scatter Plot of Percent Forested vs US Tourism LQ in Appalachia

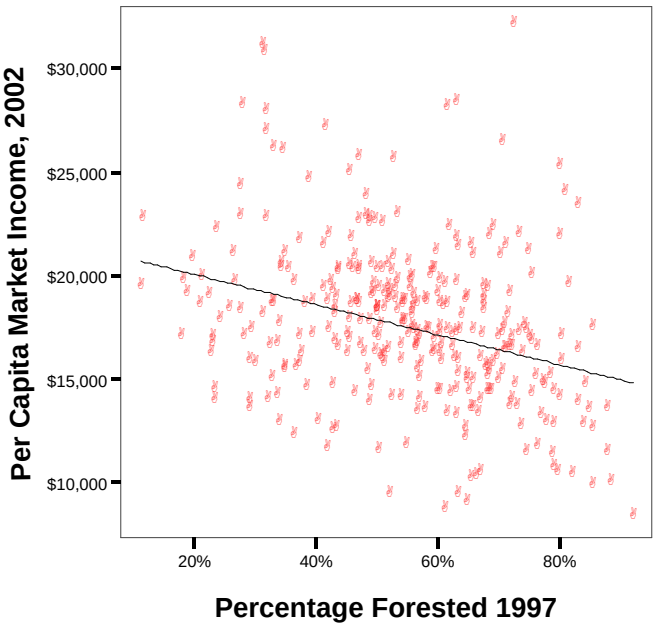

Figure 5.10: Scatter Plot of Per Capita Market Income vs Percentage Forested in Appalachia

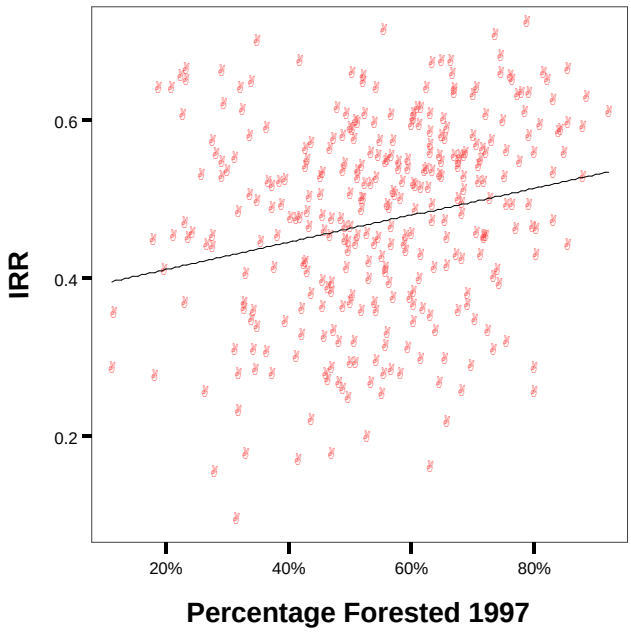

Figure 5.11: Scatter Plot of IRR vs Percentage Forested for Appalachia

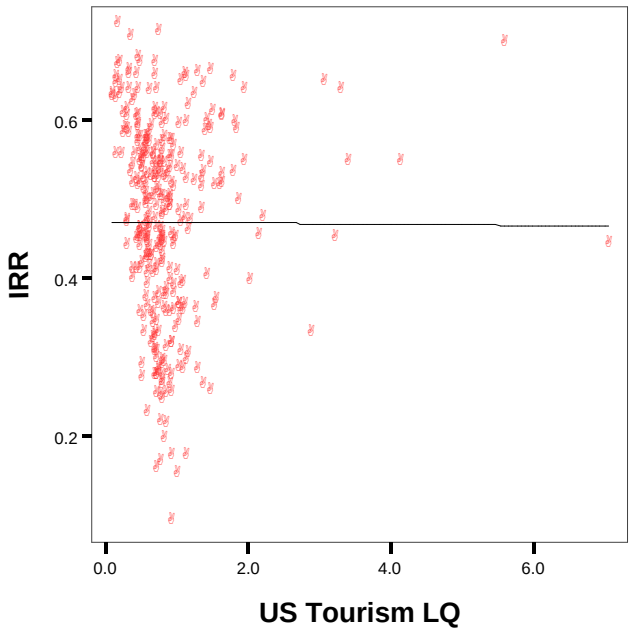

Figure 5.12: Scatter Plot for IRR vs US Tourism LQ for Appalachia

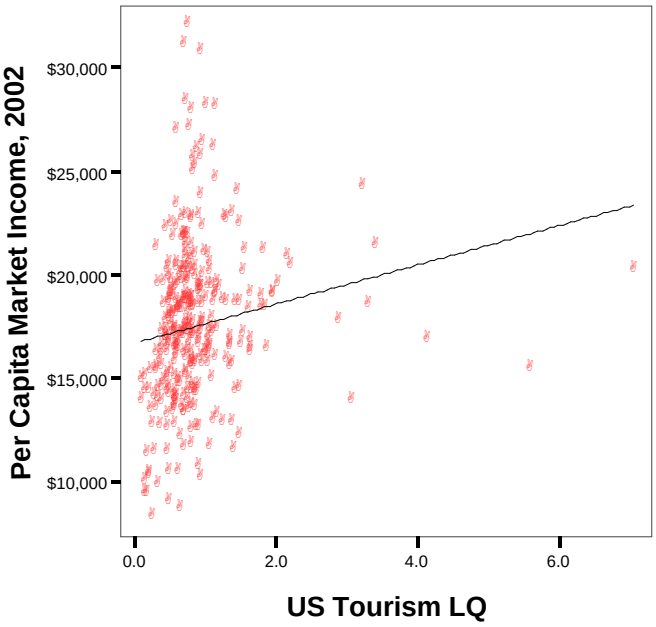

Figure 5.13: Scatter Plot of Per Capita Market Income vs US Tourism LQ for Appalachia

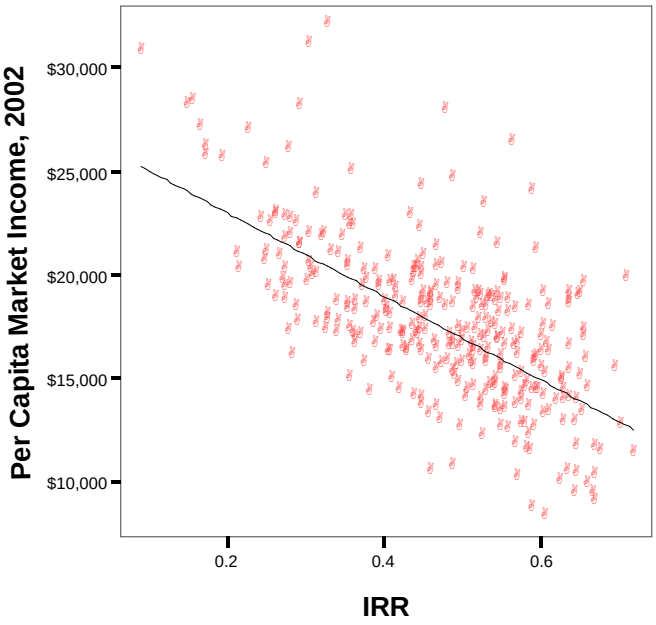

Figure 5.14: Scatter Plot of Per Capita Market Income vs IRR for Appalachia

5.7 RESULTING IMPACT OF FOREST TOURISM IN EXURBAN APPALACHIA

I expected to show, through the hypotheses that tourism was a viable alternative to former economic bases. The catalyst to this tourism was expected to be the presence of forest cover, where recreational areas are abundant. Exurbia was predicted to be the part of the urban gradient that could take the greatest advantage of this type of tourism, through its unique location in proximity to both people and natural areas. I expected this type of economic alternative to work, due to the changes brought by the postindustrial economy. The corresponding models were created to test whether my predictions regarding forest tourism were likely in exurban Appalachia. The results of the data

explain the impact of the three subjects that make up forest tourism in exurban Appalachia, exurbia, forests, and the economy through tourism, with each other. When compared together, the results of the models explain the impacts of the overall forces of postindustrial change on these processes.

When comparing forests to exurbia, it was shown that the amount of forest cover rises with rurality. Thus, the more rural a county is, the more likely it will have more forest cover. This effect is the greatest in rural areas, but also occurs in exurban areas, though not in urban areas. The fact the there is less of a correlation between forests and rurality in exurbia explains the nature of exurbia, as patchy development that has no solid edge, thus allowing forest cover to be more even throughout exurbia. I predicted that exurbia would have unique advantages because of its forest cover. In a way, the results show it does, because forest cover is more constant in exurbia than in urban and rural areas of Appalachia. Thus, the data shows the potential of forests in exurbia, even if that potential has yet to be realized.

Forests also related to the economy and economic change. Connected to the fact that forests are found increasing with rurality, forests also seem to have negative impacts on the economy. A rise in forest cover decreases the Per Capita Market Income of people in a county. An increase in amount of forest cover also decreases the impact of tourism in a county's economy. This shows that, due to the fact that they are rural, forests are still not great agents of economic potential. These findings go against what I predicted the impact of forests would be. It appears that forests, instead of providing an incentive for tourism, are still an obstruction to the development of growth in tourism.

The data showed that there are many relationships shown between exurbia and the economy. A rise in rurality causes a decrease in the income for people in a county, meaning that the more rural a county is, the less income people earn there. Also, the impact of tourism on a county seems to get greater the more rural a county is. A larger amount of the economy of a county is involved in tourism the more rural a county is. But, the more populous the Core Based Statistical Area that a county lies in is, the greater the impact of tourism on a county. The impact of rural poverty seems to hinder tourism greater as a county becomes more rural. I predicted that exurbia would benefit from its location near urban areas when it came to tourism's potential. The data showed that being part of a large metropolitan area does improve tourism's impact on the economy. But, the data also showed that being farther away from the urban core increase the impact of tourism on an economy, and being too far away can be hindered by rural poverty. Thus, this data does make an argument that exurbia does hold tourism potential.

Overall, the data tells a different story than I predicted it would. Forest tourism does not seem to be a catalyst for tourism at this time, because incomes and the impact of tourism decrease with an increase of forest cover. Exurbia is an area where forest cover is prevalent and more stable than in other parts of the urban gradient, but the presence of forests has not caused tourism, as I predicted it would. Exurbia does show potential for tourism. It benefits from being in proximity to large urban areas, and also benefits due to tourism's greater presence in more rural areas. This shows that tourism may be an economic alternative in exurban Appalachia, but forests are not the catalyst. Also, it seems that tourism may be an economic alternative, but the economic benefit from

tourism jobs appears to be limited. Through the data collected from the four models, I was able to see a clearer picture of the processes occurring in Appalachia.

CHAPTER 6

6 CONCLUSION

6.1 FINDINGS

Through this analysis, the problem of a struggling economy in postindustrial Appalachia was attempted to be solved, with forest tourism in exurbia. To measure the effects of tourism in forests, the topics of exurbia, forests, and tourism were analyzed, in order to show economic potential. These aforementioned topics are all related because they are subject to change due to economic conditions. Through this analysis, it was shown that tourism has great potential to have a positive economic impact in Appalachia, though the role of forests could not be proven to be a catalyst for a tourism economy. The results of the models show that each of the topics that make up forest tourism in exurban Appalachia are dependent on each other, and are interwoven into one process. The role of tourism in exurban Appalachia needs to be examined further, but through this analysis I was able to better understand the processes at work in exurban Appalachia.

Where a place lies on the urban spectrum is shown to be an important factor in determining a county's potential for forest tourism. It has been shown that the more rural

an area is, the lower the income potential for people living there. This shows the need for more economic actors away from urban and suburban areas. It was also shown that tourism has a greater impact on a county's economy the more rural it is. This shows the emergence of tourism as an alternative in exurban and rural areas. The influences of large metropolitan areas were shown to improve these tourism possibilities. Exurbia's place on the urban gradient was shown to be beneficial because proximity to large markets allows for higher wages and higher incomes, but proximity to rural areas allows for tourism to become a greater part of the economy.

The fact that exurbia was looked at in terms of economic impacts would a key contribution of this analysis. Exurbia, as a unique place on the urban gradient, creates a unique footprint on a regional economy. The idea that tourism might have a unique potential for this specific place on the urban gradient has not been previously studied, and may lead to further study. Exurbia was shown to have different attributes when it came to forest tourism than urban or rural areas, in terms of how this particular level of rurality relates to forests and their economic potential.

Forests were hypothesized to have a unique value that other land uses do not. From the results of the data, it seems that there lies much potential in forest tourism that has yet to be tapped into because of forests location on the urban gradient. Forest cover was found to be greater the more rural a county is. This trend seems to be lessened in exurbia, where forest cover was shown to be more even. This shows that exurbia does not replace forests, but develops with them. Forest cover was shown to decrease income in a county, as well as tourism's impact, disproving the theory that forests are a catalyst for tourism. This related to the fact that forests are found in more rural areas, and rurality

decreases income. From this, one can infer that the economic potential of forests is being harmed by rurality, and the potential for forest tourism has yet to take shape in many places in Appalachia.

Tourism was hypothesized to be an economic alternative that could bring benefits to places in Appalachia that have suffered from the loss of the natural resource extraction economy and manufacturing jobs. Several factors seem to be limiting tourism in the form of forest tourism from becoming an economic alternative. The negative attributes that rural and exurban areas have are preventing tourism. Even though tourism has a greater impact on rural areas, rural poverty is a negative impact on tourism, and increases as a problem the more rural an area is. Tourism has not been able to yet have a positive impact from areas that are forested. Areas that are more rural have more of their economy in the tourism industry, but have lower incomes. Tourism, thus, might not be providing good jobs to areas, even as they provide some economic alternatives.

Some connections between the topics were not found to be as expected. The presence of forests did not increase economic opportunities for a county, as measured in Per Capita Market Incomes. Exurbia was not proven to be at a particular advantage when it comes to tourism, with rural areas seeing a higher percentage of their economy in the tourism industry. Exurban areas may have a smaller base of tourism that rural areas, but have a higher base than urban areas, which have decreased incomes with increases in tourism. Tourism does not appear to be an agent of exurbanization due to the fact that an increase in tourism does not correspond with a decrease in rurality.

The current situation in Appalachia is that there are many rural and exurban areas in which people have lower incomes and have a high degree of rural poverty. These

same areas have a higher amount of forests, and when they do have tourism, it provides a greater impact to their economy than in urban areas. This could represent an untapped potential for forest tourism in exurban Appalachia. Exurban areas in Appalachia need to overcome their negatives that hold tourism potential back, like poverty and rurality being seen as an economic negative. The forces of economic change that have helped develop exurbia, tourism, and forest to converge to create forest tourism in exurban Appalachia have not gone away, and will continue to present opportunities in the future.

Some of the results point to the fact that tourism might not be the best economic alternative for areas of Appalachia. Tourism might provide lower wages to people, even if it is providing jobs. Rural areas were shown to have a higher degree of tourism infiltration into their economy, yet still lagged in wages. Not everyone can benefit equally in a tourism based economy. It relies on service sector jobs near points of access, and does not provide the types of blue collar jobs that were previously a large part of the Appalachian economy. Also, tourism is a very vulnerable industry. Slight changes in the national economy or changing weather patterns can quickly change the prospects for a place to draw tourists. People have changing preferences, which might not find a particular area worth visiting. With Appalachia's access relying on the automobile, rising gas prices might prove to be detrimental to tourism possibilities.

The results of this analysis might be skewed because of how Appalachia was defined. As mentioned in Chapter 3, Appalachia can be defined by its political boundaries, socioeconomic boundaries, or physical boundaries. With each definition, the economy situation and solutions change because they encompass different areas. Variables will change depending on what set of counties the study area encompasses.

Geographic sub regions were not analyzed that could change the outcome of results. Whether the effects noted are even across all of Appalachia is still unknown from this analysis.

Appalachia was chosen as the region of analysis because of its economic and environmental history. Potential for economic gain were seen to be greater here than other parts of the United States. What this analysis tells us is that Appalachia is still an area in which economic problems persist in non-urban areas. Exurban areas in Appalachia do have steady amounts of forestland that is not being overtaken by development. This analysis did not compare Appalachia to the United States in general. A future comparative analysis could determine how these trends differ across regions.

6.2 FUTURE RESEARCH

There are several lines of research that can be carried out to further test the impacts of forest tourism in exurban Appalachia. One question that needs to be asked is if tourism is a positive economic alternative. The analysis has shown that tourism has a greater affect in areas that are more rural, but those areas have decreased incomes. Could tourism provide jobs, but those jobs that are low paying? There is a possibility that tourism, when replacing industries of natural resource extraction and manufacturing, is not replacing the wages of these former industries. Also, there are many environmental impacts related to tourism in forests that need to be explored. Even though tourism as seen as ‘greener’ than natural resource extraction and manufacturing, does it bring its own set of environmental problems, in the form of pollution, increased human activities in wildlife areas, and tourism facility development?

It seems as though the semi-isolated nature of exurbia is creating a decrease in tourism opportunity. The affect of access on tourism needs to be explored more when it comes to forest tourism. The distance tourists travel to get to destinations in Appalachia could be a beneficial topic for future research. If one cannot reach a forest by car, then the tourism possibility is extremely low. Also, Appalachia is a large and diverse region, and needs to be explored on the sub regional level to explore the different effects of tourism on the different parts of Appalachia. This could determine if topology, climate, culture, environmental attributes, and other social attributes that have not yet been explored play a role in tourism development.

This study looked at Appalachia as a whole region, when in reality Appalachia is very diverse. Future research could focus on local lesion of forests tourism. Tourism have very localized effects to an economy, and some counties, such as the outlier mentioned in Chapter 4, have a much greater potential for tourism based on their local situations. Particular counties might fit well with this study, but the reasons that they fit might be different. Local variable that might create a large demand or lack of demand for tourism might be left out of regional studies, thus creating the need to look at each case of tourism for a county separately, and seeking the benefits of a local scale of analysis rather than a regional scale of analysis.

The role of exurbia and a regional economy also needs to be further explored. Can exurbia create an economic base of its own, or does it inherently rely on urban areas? Can tourism use exurbia and its proximity to both people and nature to its advantage, or is this a disadvantage, because it neither is away from it all or in the middle of everything? Rural areas and urban areas both have well defined advantages when it

comes to tourism, but what about exurbia? As the amount of land that is becoming exurbia increases, these could be worthwhile questions.

APPENDIX A

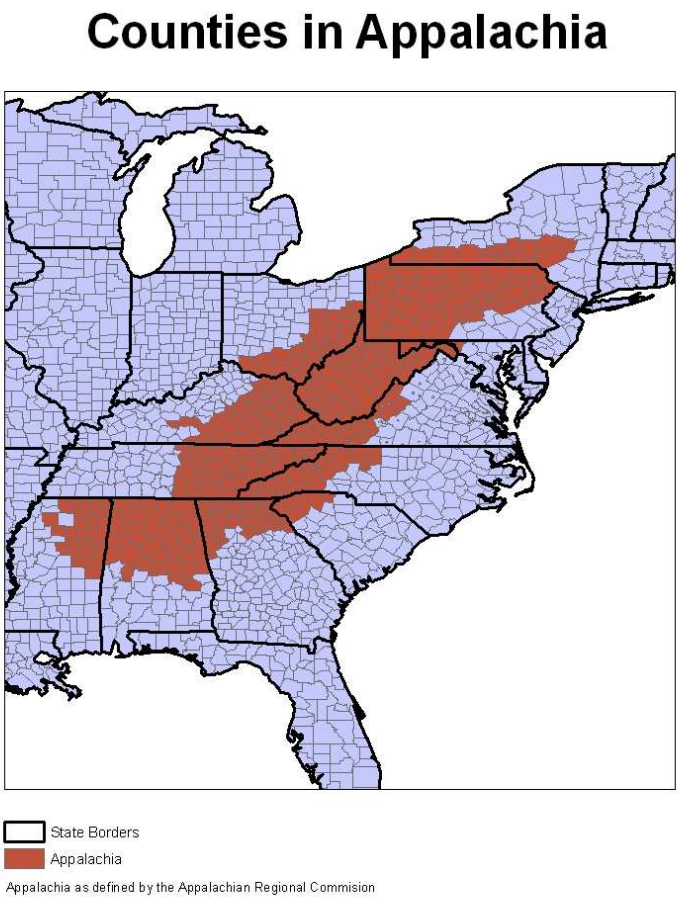

Figure A.1: Counties in Appalachia

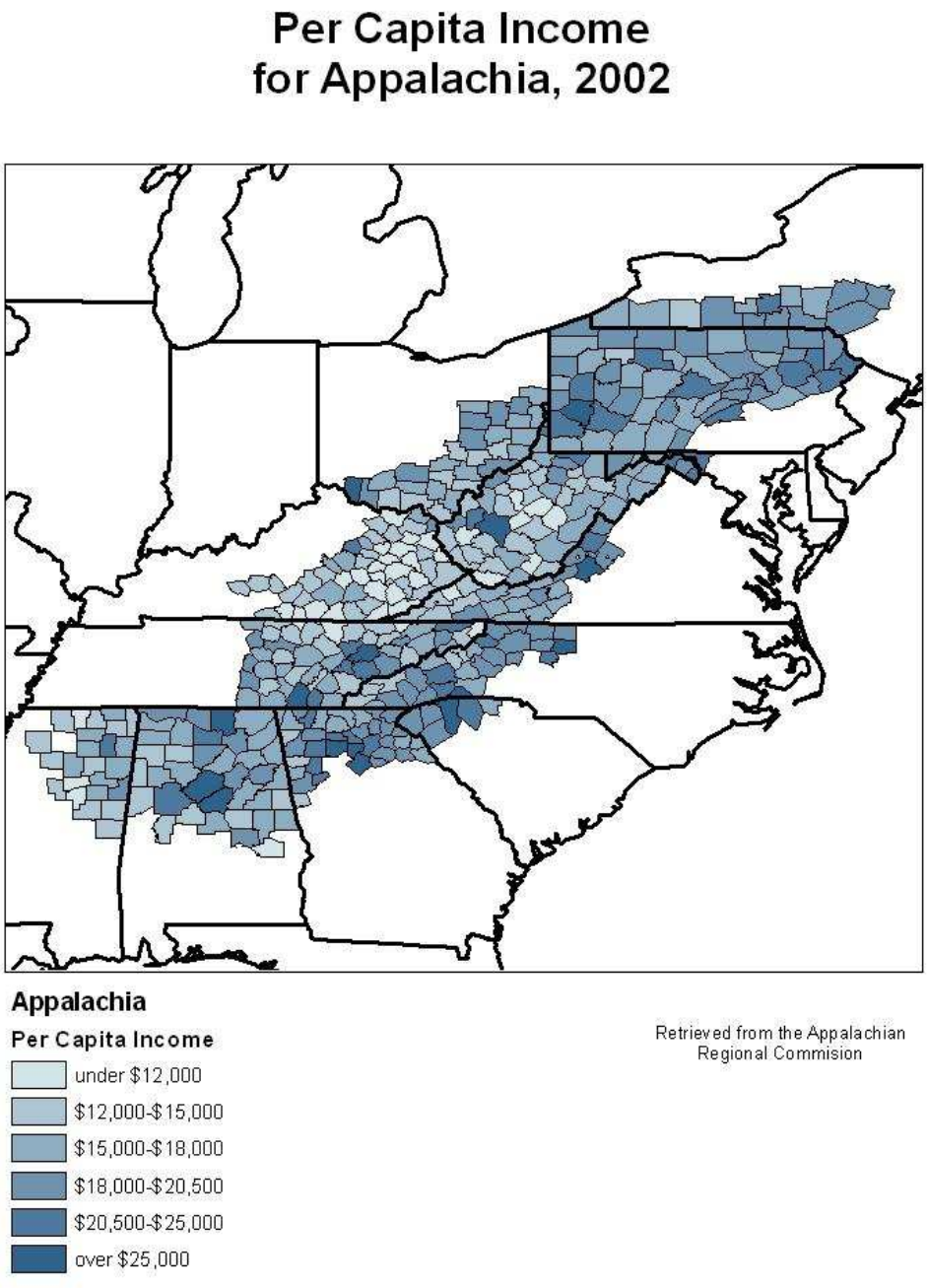

Figure A.2: Per Capita Income for Appalachia, 2002

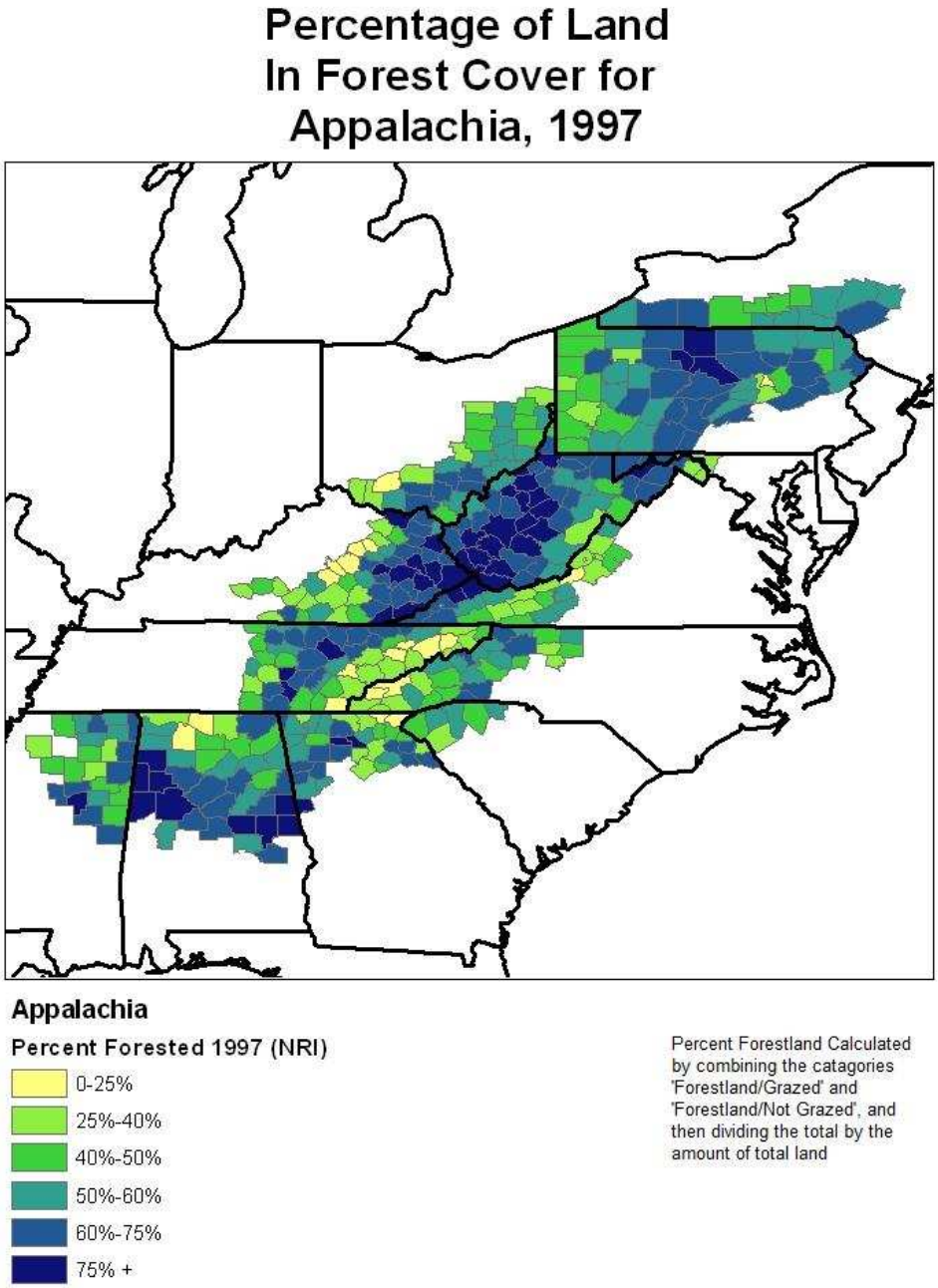

Figure A.3: Percentage of Land In Forest Cover for Appalachia, 1997

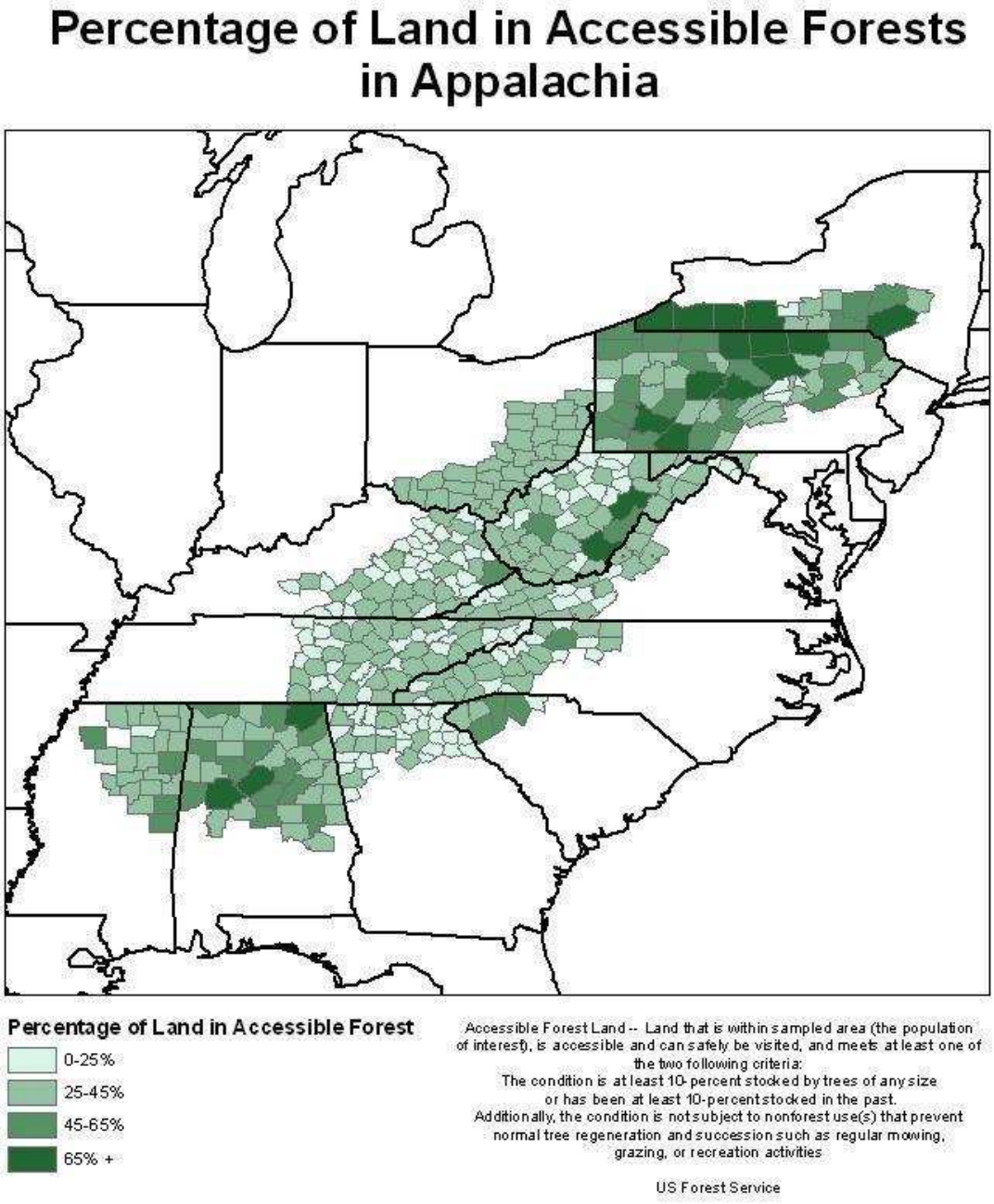

Figure A.4: Percentage of Land in Accessible Forests in Appalachia

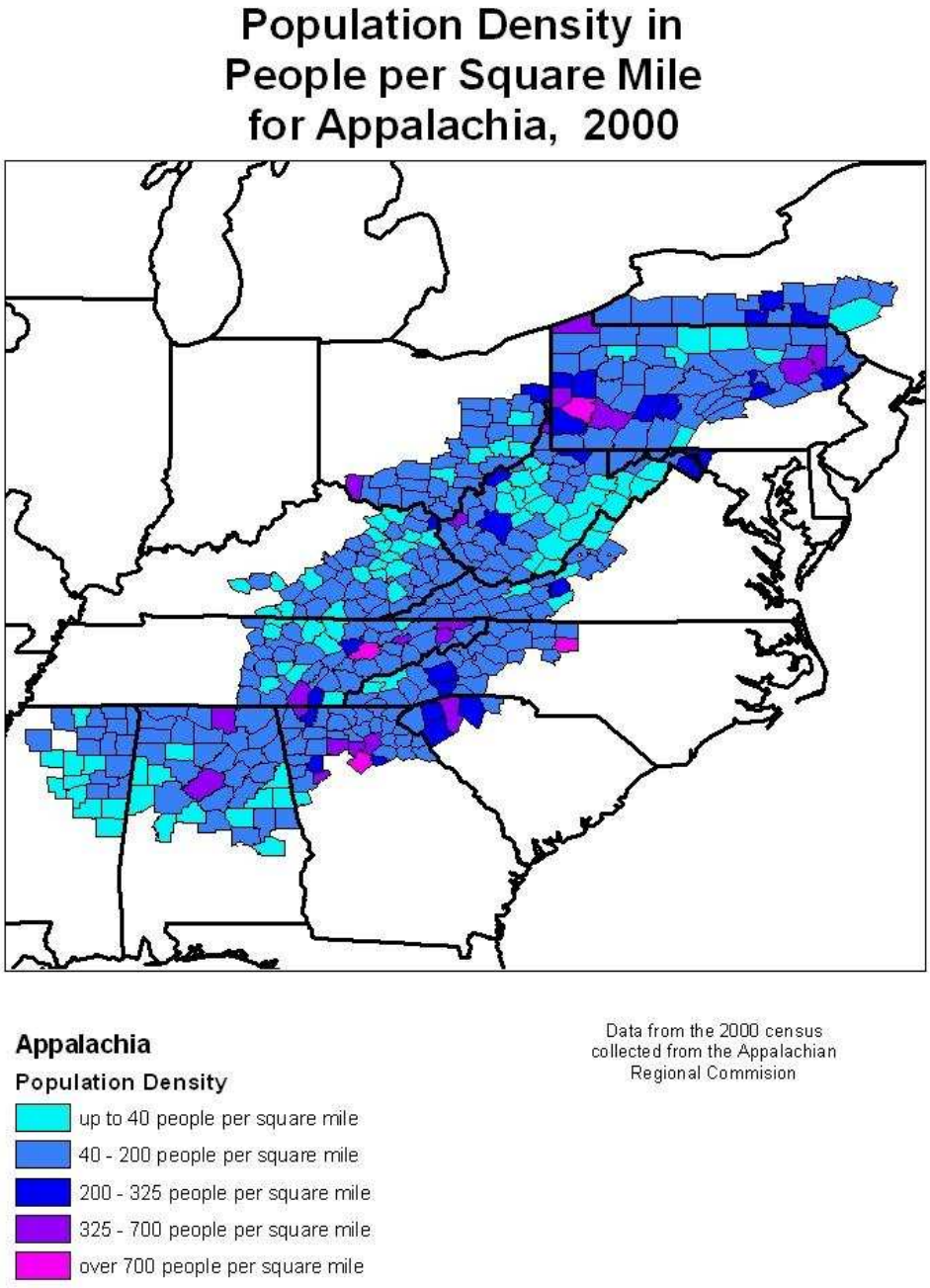

Figure A.5: Population Density in People per Square Mile for Appalachia, 2000

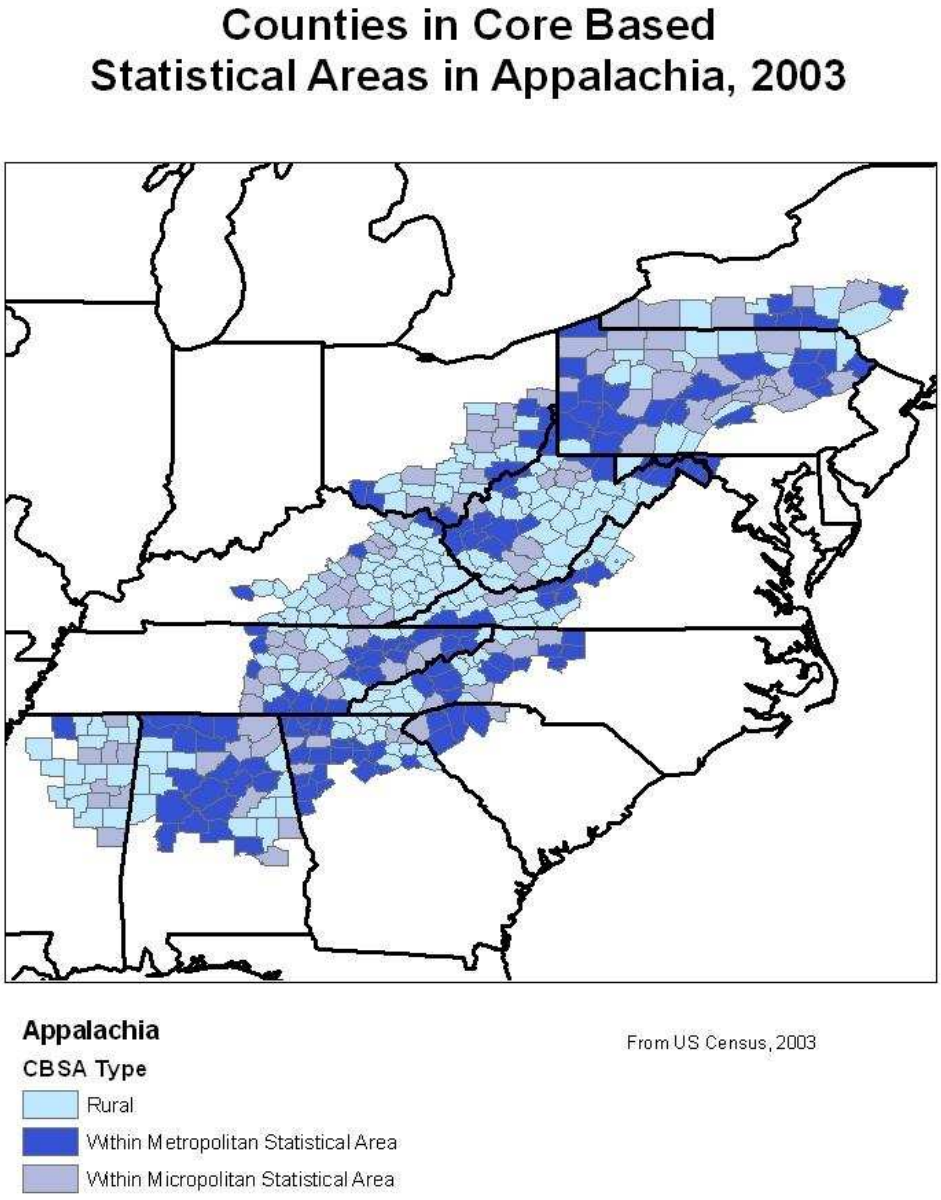

Figure A.6: Counties in Core Based Statistical Areas in Appalachia, 2003

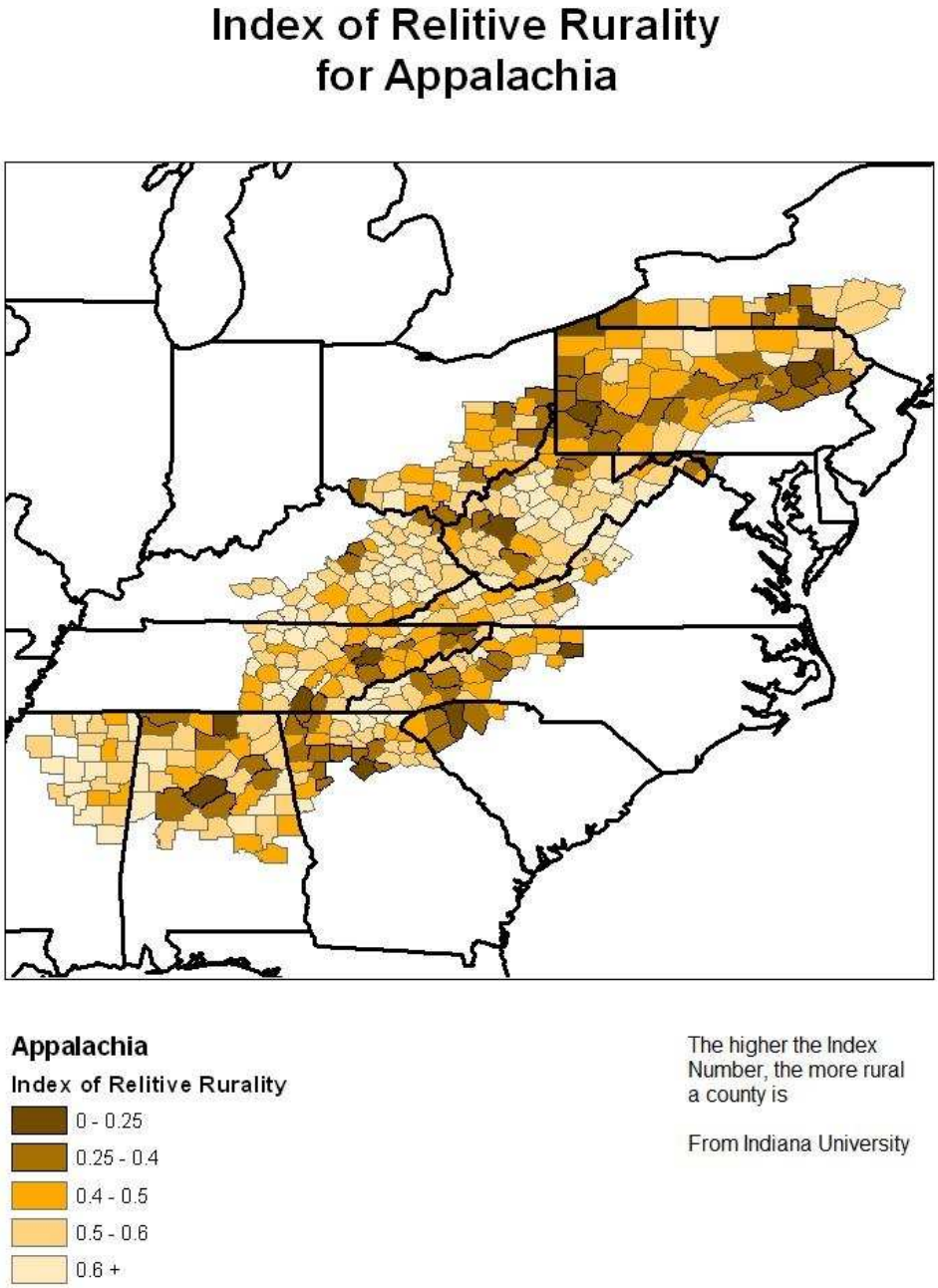

Figure A.7: Index of Relative Rurality for Appalachia

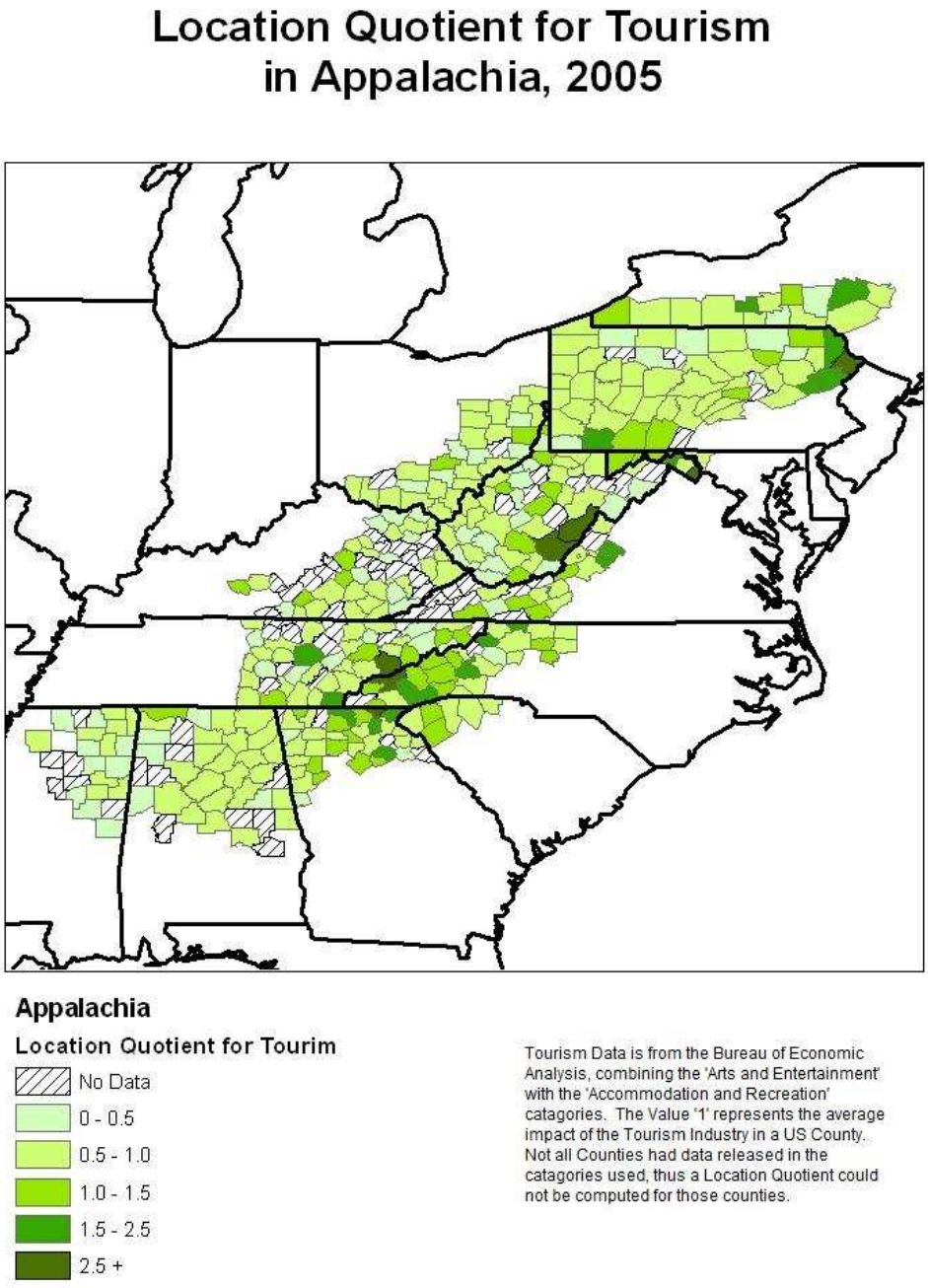

Figure A.8: Location Quotient for Tourism in Appalachia, 2005

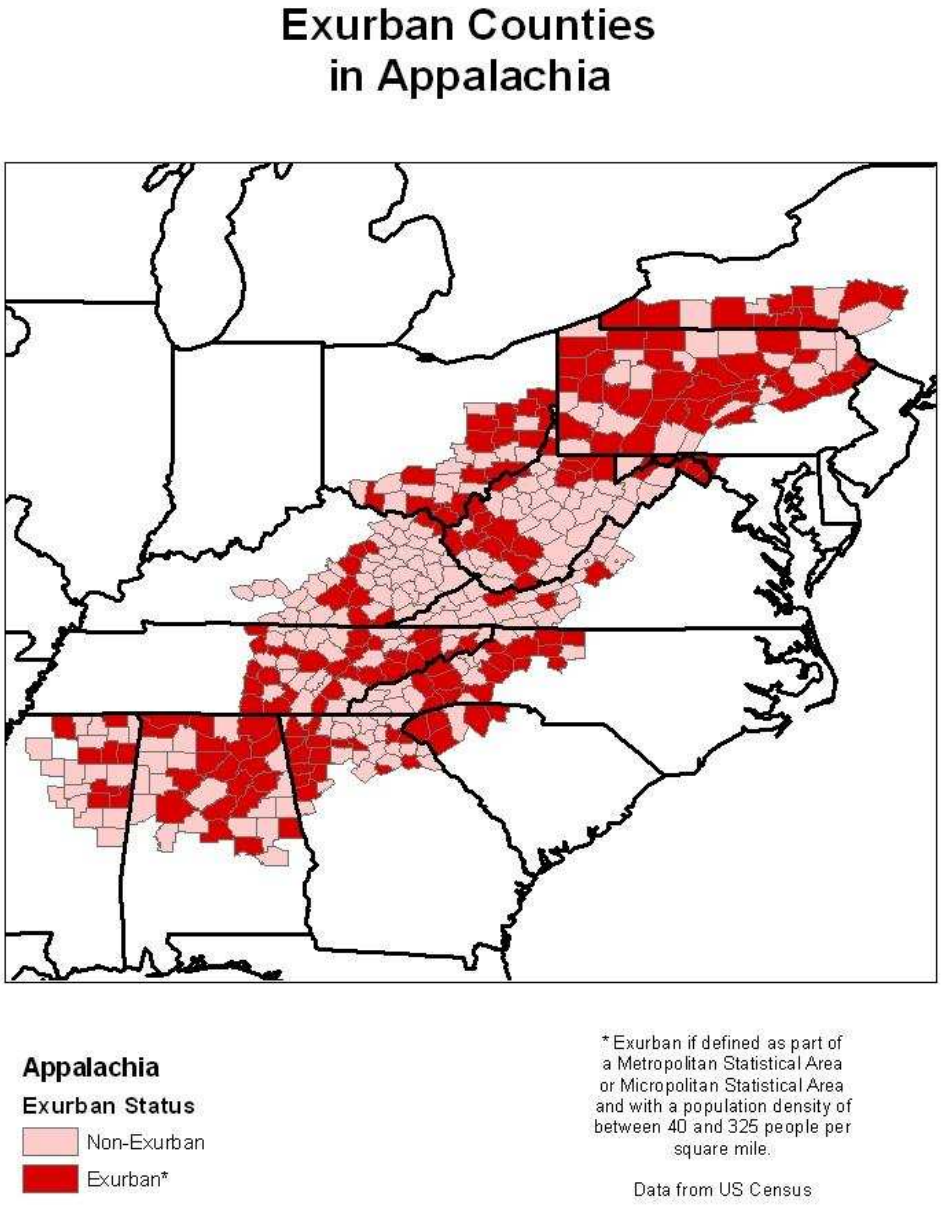

Figure A.9: Exurban Counties in Appalachia

County and State
Alcorn MS
Alexander NC
Allegany MD
Anderson SC
Anderson TN
Armstrong PA
Athens OH
Barrow GA
Bartow GA
Bell KY
Belmont OH
Berkeley WV
Blair PA
Blount AL
Blount TN
Boone WV
Botetourt VA
Boyd KY
Bradford PA
Bradley TN
Brooke WV
Broome NY
Brown OH
Buncombe NC
Burke NC
Butler PA
Caldwell NC
Calhoun AL
Cambria PA
Campbell TN
Cannon TN
Carbon PA
Carroll GA
Carroll OH
Carter TN
Cattaraugus NY
Centre PA
Chambers AL

Continued

Figure A.10: Exurban Counties

Chattooga GA
Chautauqua NY
Chemung NY
Cherokee SC
Chilton AL
Clark KY
Clay MS
Clearfield PA
Clinton PA
Cocke TN
Coffee TN
Colbert AL
Columbia PA
Columbiana OH
Cortland NY
Coshocton OH
Crawford PA
Cullman AL
Cumberland TN
Davie NC
Dawson GA
DeKalb AL
Elk PA
Elmore AL
Etowah AL
Fayette PA
Fayette WV
Floyd GA
Franklin TN
Gallia OH
Gordon GA
Greene TN
Greenup KY
Guernsey OH
Habersham GA
Haralson GA
Harrison WV
Hawkins TN

Continued

Figure A.10: Exurban Counties

Haywood NC
Henderson NC
Huntingdon PA
Indiana PA
Itawamba MS
Jackson AL
Jefferson OH
Jefferson TN
Jefferson WV
Kanawha WV
Lauderdale AL
Laurel KY
Lawrence OH
Lawrence PA
Lee MS
Limestone AL
Lincoln WV
Loudon TN
Lowndes MS
Lycoming PA
Macon TN
Madison GA
Madison KY
Madison NC
Marion TN
Marion WV
Marshall AL
Marshall MS
Marshall WV
Mason WV
McKean PA
McMinn TN
Mercer PA
Mercer WV
Mifflin PA
Mineral WV
Monongalia WV
Monroe PA

Continued

Figure A.10: Exurban Counties

Montgomery (+ Radford city) VA
Montgomery KY
Montour PA
Morgan AL
Morgan WV
Muskingum OH
Oconee SC
Oktibbeha MS
Otsego NY
Paulding GA
Perry PA
Pickens GA
Pickens SC
Pike PA
Pleasants WV
Polk GA
Pontotoc MS
Preston WV
Pulaski KY
Pulaski VA
Putnam TN
Putnam WV
Raleigh WV
Roane TN
Rockcastle KY
Ross OH
Rutherford NC
Schoharie NY
Schuylkill PA
Scioto OH
Sequatchie TN
Sevier TN
Shelby AL
Smith TN
Snyder PA
Somerset PA
Spartanburg SC
St. Clair AL

Continued

Figure A.10: Exurban Counties

Stephens GA
Steuben NY
Stokes NC
Surry NC
Talladega AL
Taylor WV
Tazewell VA
Tioga NY
Tompkins NY
Transylvania NC
Tuscaloosa AL
Tuscarawas OH
Unicoi TN
Union PA
Union TN
Venango PA
Walker AL
Walker GA
Warren PA
Warren TN
Washington (+ Bristol city) VA
Washington MD
Washington OH
Washington PA
Watauga NC
Wayne WV
Whitfield GA
Whitley KY
Wilkes NC
Wood WV
Wyoming PA
Yadkin NC

Figure A.10: Exurban Counties

County and State
Adams OH
Allegany NY
Alleghany (+ Clifton Forge city + Covington city) VA
Alleghany NC
Ashe NC
Bedford PA
Bibb AL
Bledsoe TN
Braxton WV
Calhoun WV
Carroll (+ Galax city) VA
Carter KY
Chenango NY
Cherokee AL
Chickasaw MS
Choctaw MS
Claiborne TN
Clarion PA
Clay AL
Clay KY
Clay NC
Clay WV
Clinton KY
Craig VA
Cumberland KY
DeKalb TN
Delaware NY
Edmonson KY
Elliott KY
Fannin GA
Fentress TN
Fleming KY
Floyd KY
Floyd VA
Franklin AL
Franklin GA
Garrett MD

Continued

Figure A.11: Rural Counties

Gilmer GA
Graham NC
Greenbrier WV
Greene PA
Hardy WV
Harlan KY
Harrison OH
Hart GA
Hart KY
Heard GA
Highland VA
Hocking OH
Holmes OH
Jackson GA
Jackson KY
Jackson NC
Jackson OH
Jackson WV
Jefferson PA
Juniata PA
Kemper MS
Knox KY
Leslie KY
Lewis KY
Lewis WV
Logan WV
Lumpkin GA
Macon NC
Marion AL
Martin KY
McDowell NC
McDowell WV
Meigs OH
Mingo WV
Mitchell NC
Monroe MS
Monroe OH
Monroe TN

Continued

Figure A.11: Rural Counties

Monroe WV
Morgan OH
Nicholas WV
Panola MS
Pendleton WV
Perry KY
Perry OH
Pickens AL
Pike KY
Pike OH
Pocahontas WV
Polk NC
Polk TN
Potter PA
Powell KY
Prentiss MS
Rabun GA
Randolph AL
Randolph WV
Rhea TN
Ritchie WV
Rockbridge (+ Buena Vista city + Lexington city) VA
Rowan KY
Russell KY
Schuyler NY
Smyth VA
Sullivan PA
Summers WV
Susquehanna PA
Swain NC
Tioga PA
Tippah MS
Tishomingo MS
Towns GA
Tyler WV
Union GA
Union MS
Upshur WV

Continued

Figure A.11: Rural Counties

Vinton OH
Wayne KY
Wayne PA
Wetzel WV
White GA
White TN
Winston MS
Wirt WV
Wolfe KY
Wyoming WV
Wythe VA
Yancey NC

Figure A.11: Rural Counties

County and State
Allegheny PA
Beaver PA
Cabell WV
Catoosa GA
Cherokee GA
Clermont OH
Douglas GA
Erie PA
Forsyth GA
Forsyth NC
Greenville SC
Gwinnett GA
Hall GA
Hamblen TN
Hamilton TN
Hancock WV
Jefferson AL
Knox TN
Lackawanna PA
Luzerne PA
Madison AL
Ohio WV
Sullivan TN
Washington TN
Westmoreland PA

Figure A.12: Urban Counties

County and State
Adair KY
Avery NC
Banks GA
Barbour WV
Bath KY
Bath VA
Benton MS
Bland VA
Breathitt KY
Buchanan VA
Calhoun MS
Cameron PA
Casey KY
Cherokee NC
Clay TN
Cleburne AL
Coosa AL
Dade GA
Dickenson VA
Doddridge WV
Elbert GA
Estill KY
Fayette AL
Forest PA
Fulton PA
Garrard KY
Giles VA
Gilmer WV
Grainger TN
Grant WV
Grayson VA
Green KY
Grundy TN
Hale AL
Hampshire WV
Hancock TN
Highland OH

Continued

Figure A.13: Counties with Data Withheld due to Disclosure Problems

Jackson TN
Johnson KY
Johnson TN
Knott KY
Lamar AL
Lawrence AL
Lawrence KY
Lee KY
Lee VA
Letcher KY
Lincoln KY
Macon AL
Magoffin KY
McCreary KY
Meigs TN
Menifee KY
Monroe KY
Montgomery MS
Morgan KY
Morgan TN
Murray GA
Noble OH
Northumberland PA
Noxubee MS
Overton TN
Owsley KY
Pickett TN
Roane WV
Russell VA
Scott TN
Scott VA
Tallapoosa AL
Tucker WV
Van Buren TN
Webster MS
Webster WV
Winston AL
Wise (+ Norton city) VA
Yalobusha MS

Figure A.13: Counties with Data Withheld due to Disclosure Problems

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