

# Upshur County

Land Use Master Plan 2013



Statue of John Wesley in front of Wesley Chapel at WV Wesleyan College Upshur County, West Virginia  
(Photo by Fryeguy91)

## Executive Summary

This Land Use Master Plan (LUMP) conveys information on Upshur County's current demographic and geographic status. This plan will be used to evaluate the potential of post-mine sites for development, and evaluate Upshur County's investment position.

Senate Bill (SB) 603 mandates the development of a LUMP by counties with surface mining operations. The LUMP will be an effective tool towards achieving Upshur County's development goals. The Nick J. Rahall Appalachian Transportation Institute (RTI) will coordinate with the Office of Coalfield Community Development to provide this essential information. To the knowledge of the researchers Upshur County has not undertaken post-mine development. This plan will help Upshur take advantage of its post-mine sites.

Upshur County had a serious loss in population after 1980, but has since grown past its 1980 high. The county's median age and age distribution indicate a population capable of productivity in the labor force.

Employment consists mainly of government services; trade, transportation, and utilities; education and healthcare and natural resources and mining. The Education and Health Services sector is the major wage contributor due to the size of the sector, with Trade, Transportation, and Utilities and Natural Resources and Mining following. Government is a major sector, as in most counties in West Virginia, but is not the highest employing or highest wage

contributor. Total wages have consistently risen for the county

Of particular note is the amount of income, as opposed to wages, derived from government transfers. Twenty-seven percent of Upshur County income is from government transfers. Upshur County is about average in West Virginia in this regard, and the ratio is actually lower than in many coalfield counties.

Upshur County's total enrollment dropped significantly until 2006, but has since been on the rise. Upshur County's dropout rate however is one of the highest in the state. Upshur County's residents have relatively good educational achievement overall, with about a fifth of residents possessing a post-secondary degree, and almost half having only a high school diploma.

Utility prices are varied throughout the county, and this plan provides municipal and private rates for electricity, sewer, and water. Broadband, an increasingly important utility in the age of globalization, is highlighted to show the necessity for improvement and access, and showcase the developable properties of this utility.

Transportation is an important issue in any development strategy. Upshur County has various transportation options, including two US routes, an extensive rail system, and a small regional airport. No major interstate traverses the county, however.

Upshur County also has eight historic s in the National Register and several pieces of

historic architecture designated by the state. Historic preservation can be a basis for tourism, cultural identity, and community cohesion.

This plan also reviews energy and environmental issues in Upshur County. The environment of the county should be considered in an overall development strategy. Upshur County contains no system of national or state parks, and has only two wildlife management areas. Upshur County is also not on the list of air pollution non-attainment areas, which is positive. Upshur County has an extensive system of gas pipelines, because of its advantageous location in the Marcellus Shale play area. Upshur is also in the area that is considered highly favorable to geothermal energy development.

This information is as critical as the site information for several reasons. One is that development is not a process that can occur in a vacuum. Without understanding the resources available in the county, and the demand for more investment, money will end up wasted. Another is that investment requires active partners who will need information on each of the county's essential demographic topics to determine their level of risk. Without this, investors will not be persuaded to enter the county. Finally, this information can help policy makers target their land use strategies to any of these topics, as long as they understand the situation.

Site analysis is integral to this report. Researchers identified all the post mine sites given certain criteria for Upshur County.

The researchers created a distance analysis using a scoring system based on distance to certain essential utilities and features, summed the scores, and plotted each score for each mine site. A workforce analysis was conducted to determine available labor within certain radii for each site, and a retail analysis was conducted to determine which areas had the most retail activity.

The four mine sites were then identified, and are displayed individually. Map A contains the sites available in a view of the county.

The tables below are comprehensive comparisons of the four post-mine sites. In Tables A and B, distances and total scores are compared between sites, providing an idea of the more suitable sites under a considered criterion. For example, if we want to look for a site which is located closest to power lines, the answer is site ranking #3, permit ID S200604. However, if we wanted the site closer to broadband, the best site is site ranking #1, permit ID S200799.

Table C explains how each criterion contributes to the final total score and importance of the weights. Because of the assumption that one criterion may be more important than others (different weights), the site with higher absolute and relative scores is still able to receive a smaller total score than others. Site ranking #1 scores poorly in some areas, such as proposed highway, power lines, and water lines, but is never last and scores well in important criteria like broadband and sewer lines.

**Table A: Distances comparison between four sites for potential development**

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Weight</b>
Existing Highway	0.24	0.17	3.10	4.74	<b>8</b>
Proposed Highway	103.85	108.13	96.88	97.18	<b>9</b>
Intermodal Terminal Facilities	24.31	18.25	33.66	38.13	<b>6</b>
Interstate	12.85	11.16	16.01	23.18	<b>8</b>
National Waterway Network Ports	98.36	93.52	105.93	108.62	<b>5</b>
Sewer Treatment Facilities	3.20	7.65	8.98	13.46	<b>7</b>
Solid Waste Treatment Facilities	3.02	3.70	4.14	5.00	<b>8</b>
Tri-state Airport	134.37	136.19	131.00	135.11	<b>3</b>
Yeager Airport	86.85	89.58	82.23	85.54	<b>3</b>
Broadband	0.57	0.69	3.34	2.12	<b>9</b>
Gas Pipes	1.20	2.40	4.01	1.11	<b>6</b>
National Waterway Network	31.07	26.24	38.64	41.45	<b>4</b>
Power Lines	0.40	0.13	0.09	0.64	<b>10</b>
Oil Pipes	0.64	0.96	1.93	5.00	<b>6</b>
Railroad	1.24	1.18	0.29	2.38	<b>5</b>
Sewer Lines	1.92	6.60	2.44	7.10	<b>8</b>
Water Lines	0.23	0.17	0.37	0.00	<b>10</b>

**Table B: Total score comparison between four sites for potential development**

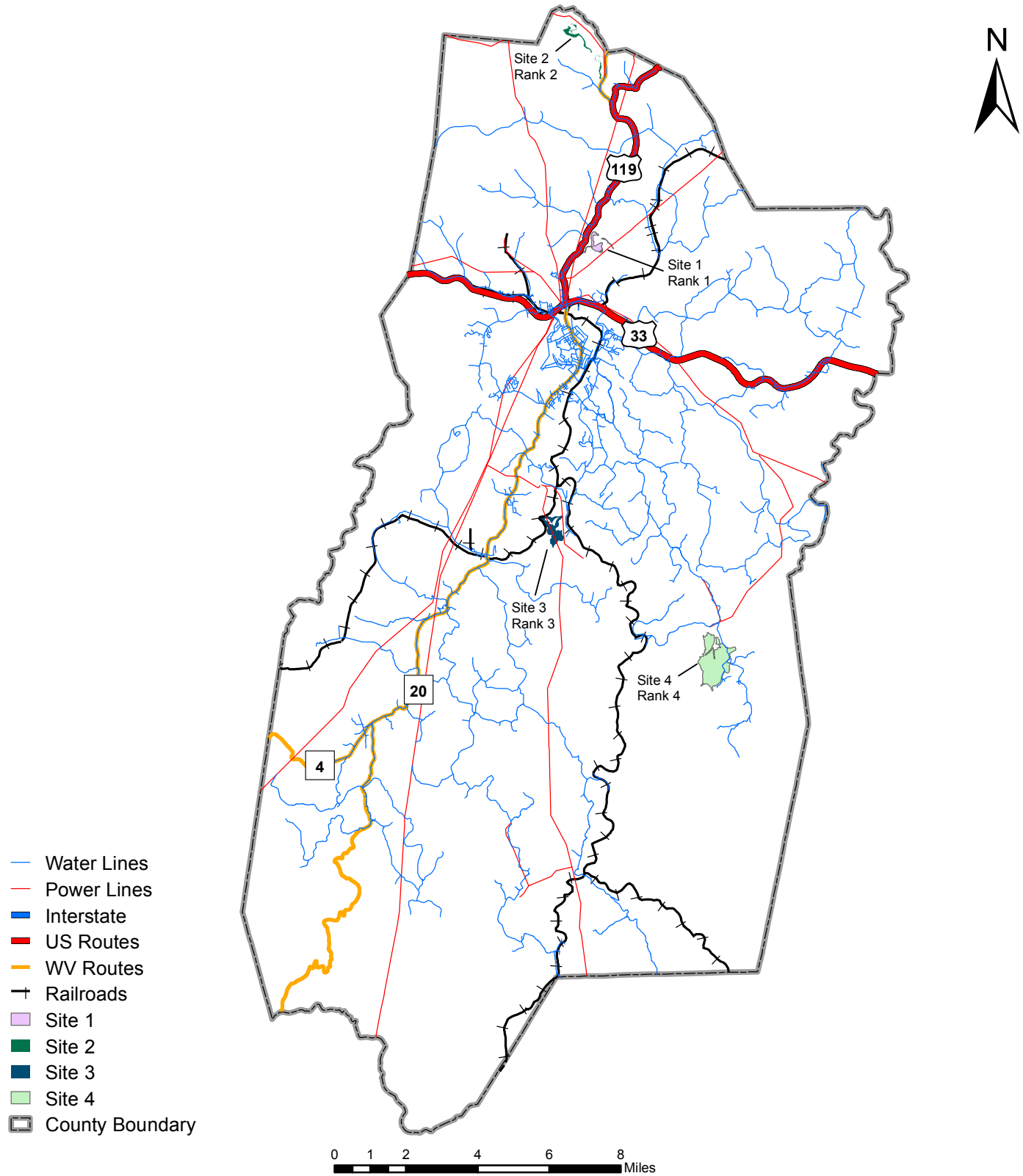
<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Weight</b>
Existing Highway	60	80	40	20	<b>8</b>
Proposed Highway	4.5	2.25	9	6.75	<b>9</b>
Intermodal Terminal Facilities	4.5	18	3	1.5	<b>6</b>
Interstate	30	40	12	2	<b>8</b>
National Waterway Network Ports	3.75	5	2.5	1.25	<b>5</b>
Sewer Treatment Facilities	70	36.75	24.5	8.75	<b>7</b>
Solid Waste Treatment Facilities	80	60	40	20	<b>8</b>
Tri-state Airport	2.25	0.75	3	1.5	<b>3</b>
Yeager Airport	1.5	0.75	3	2.25	<b>3</b>
Broadband	90	67.5	22.5	45	<b>9</b>
Gas Pipes	45	30	15	60	<b>6</b>
National Waterway Network	3	4	2	1	<b>4</b>
Power Lines	50	75	100	25	<b>10</b>
Oil Pipes	60	45	30	15	<b>6</b>
Railroad	25	37.5	50	12.5	<b>5</b>
Sewer Lines	80	28	60	14	<b>8</b>
Water Lines	50	75	25	100	<b>10</b>
<b>Total Score</b>	659.5	605.5	441.5	336.5	

**Table C: Absolute/relative score comparison between four sites for potential development**

<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Weight</b>
Existing Highway	7.5	10	5	2.5	<b>8</b>
Proposed Highway	5	2.5	10	7.5	<b>9</b>
Intermodal Terminal Facilities	7.5	10	5	2.5	<b>6</b>
Interstate	7.5	10	5	2.5	<b>8</b>
National Waterway Network Ports	7.5	10	5	2.5	<b>5</b>
Sewer Treatment Facilities	10	7.5	5	2.5	<b>7</b>
Solid Waste Treatment Facilities	10	7.5	5	2.5	<b>8</b>
Tri-state Airport	7.5	2.5	10	5	<b>3</b>
Yeager Airport	5	2.5	10	7.5	<b>3</b>
Broadband	10	7.5	2.5	5	<b>9</b>
Gas Pipes	7.5	5	2.5	10	<b>6</b>
National Waterway Network	7.5	10	5	2.5	<b>4</b>
Power Lines	5	7.5	10	2.5	<b>10</b>
Oil Pipes	10	7.5	5	2.5	<b>6</b>
Railroad	5	7.5	10	2.5	<b>5</b>
Sewer Lines	10	5	7.5	2.5	<b>8</b>
Water Lines	5	7.5	2.5	10	<b>10</b>
<b>Total Absolute Score</b>	127.5	120	105	72.5	
<b>Suitability Ranking</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Weight</b>
Existing Highway	10	10	10	10	<b>8</b>
Proposed Highway	1	1	1	1	<b>9</b>
Intermodal Terminal Facilities	1	3	1	1	<b>6</b>
Interstate	5	5	3	1	<b>8</b>
National Waterway Network Ports	1	1	1	1	<b>5</b>
Sewer Treatment Facilities	10	7	7	5	<b>7</b>
Solid Waste Treatment Facilities	10	10	10	10	<b>8</b>
Tri-state Airport	1	1	1	1	<b>3</b>
Yeager Airport	1	1	1	1	<b>3</b>
Broadband	10	10	10	10	<b>9</b>
Gas Pipes	10	10	10	10	<b>6</b>
National Waterway Network	1	1	1	1	<b>4</b>
Power Lines	10	10	10	10	<b>10</b>
Oil Pipes	10	10	10	10	<b>6</b>
Railroad	10	10	10	10	<b>5</b>
Sewer Lines	10	7	10	7	<b>8</b>
Water Lines	10	10	10	10	<b>10</b>
<b>Total Relative Score</b>	111	107	106	99	

# Top Sites for Potential Development

## Upshur County



Source: Rahall Transportation Institute Analysis 2013

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### Site's General Info

Permittee	Jerry Stalnaker Coal Company Inc
Facility Name	Rice Surface Mine Operation
Permit ID	S200799
Issue Date	5/19/2000
Expiration Date	5/19/2005
Current Acres	57.63
Lat	39° 01' 29.0000"
Long	80° 13' 03.0000"
Nearest Post Office	Buckhannon

Site Number	<b>1</b>
Suitability Ranking	<b>1</b>
Total Score	<b>659.5</b>

### Distance Analysis Results

Existing Highway	0.24
Proposed Highway	103.85
Intermodal Terminal Facilities	24.31
Interstate	12.85
National Waterway Network Ports	98.36
Sewer Treatment Facilities	3.20
Solid Waste Treatment Facilities	3.02
Tri-state Airport	134.37
Yeager Airport	86.85
Broadband	0.57
Gas Pipes	1.20
National Waterway Network	31.07
Power Lines	0.40
Oil Pipes	0.64
Railroads	1.24
Sewer Lines	1.92
Water Lines	0.23



### Site's General Info

Permittee	Marion Docks, Inc.
Facility Name	Unknown
Permit ID	S200892
Issue Date	11/30/1992
Expiration Date	11/30/2002
Current Acres	57.84
Lat	39° 05' 42.0000"
Long	80° 12' 51.0000"
Nearest Post Office	Century

Site Number	<b>2</b>
Suitability Ranking	<b>2</b>
Total Score	<b>605.5</b>

### Distance Analysis Results

Existing Highway	0.17
Proposed Highway	108.13
Intermodal Terminal Facilities	18.25
Interstate	11.16
National Waterway Network Ports	93.52
Sewer Treatment Facilities	7.65
Solid Waste Treatment Facilities	3.70
Tri-state Airport	136.19
Yeager Airport	89.58
Broadband	0.69
Gas Pipes	2.40
National Waterway Network	26.24
Power Lines	0.13
Oil Pipes	0.96
Railroads	1.18
Sewer Lines	6.60
Water Lines	0.17





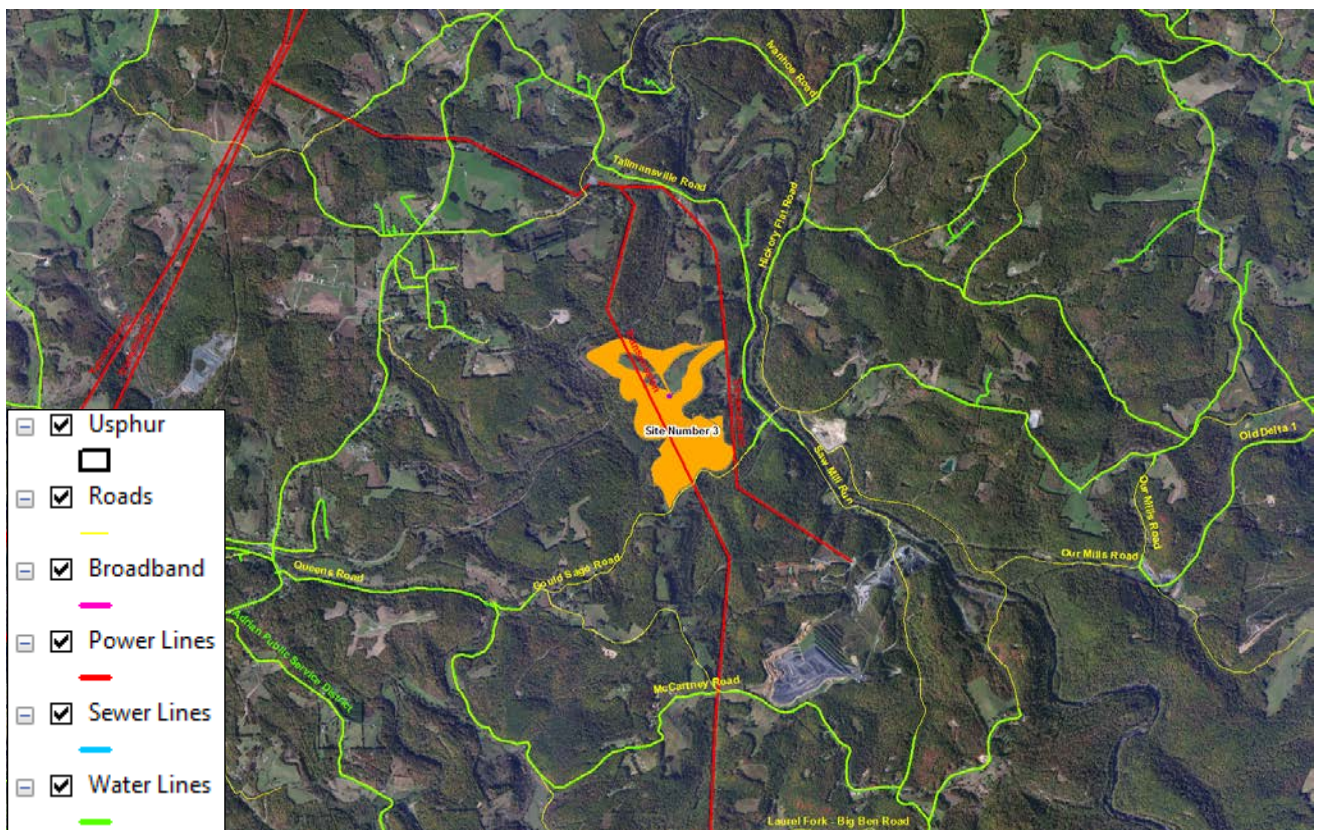
### Site's General Info

Permittee	Nesco, Inc.
Facility Name	Lane Ridge Surface Mine
Permit ID	S200604
Issue Date	1/27/2005
Expiration Date	1/27/2015
Current Acres	161
Lat	38° 54' 58.0000"
Long	80° 14' 21.0000"
Nearest Post Office	Adrian

Site Number	<b>3</b>
Suitability Ranking	<b>3</b>
Total Score	<b>441.5</b>

### Distance Analysis Results

Existing Highway	3.10
Proposed Highway	96.88
Intermodal Terminal Facilities	33.66
Interstate	16.01
National Waterway Network Ports	105.93
Sewer Treatment Facilities	8.98
Solid Waste Treatment Facilities	4.14
Tri-state Airport	131.00
Yeager Airport	82.23
Broadband	3.34
Gas Pipes	4.01
National Waterway Network	38.64
Power Lines	0.09
Oil Pipes	1.93
Railroads	0.29
Sewer Lines	2.44
Water Lines	0.37



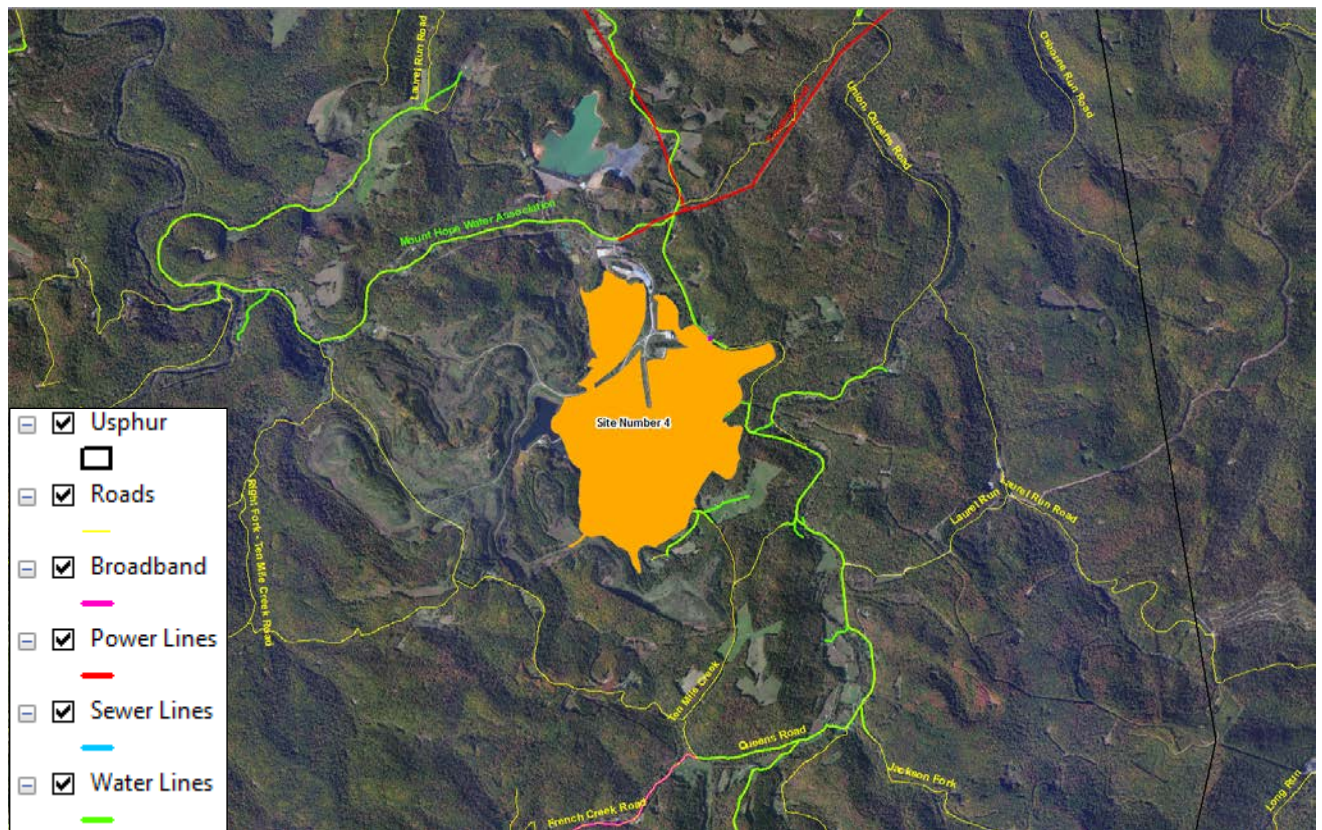
### Site's General Info

Permittee	Upshur Property, Inc.
Facility Name	Upshur Complex
Permit ID	S005780
Issue Date	6/24/1980
Expiration Date	7/31/1997
Current Acres	580.9
Lat	38° 52' 14.0000"
Long	80° 08' 40.0000"
Nearest Post Office	Tallmansville

Site Number	<b>4</b>
Suitability Ranking	<b>4</b>
Total Score	<b>336.5</b>

### Distance Analysis Results

Existing Highway	4.74
Proposed Highway	97.18
Intermodal Terminal Facilities	38.13
Interstate	23.18
National Waterway Network Ports	108.62
Sewer Treatment Facilities	13.46
Solid Waste Treatment Facilities	5.00
Tri-state Airport	135.11
Yeager Airport	85.54
Broadband	2.12
Gas Pipes	1.11
National Waterway Network	41.45
Power Lines	0.64
Oil Pipes	5.00
Railroads	2.38
Sewer Lines	7.10
Water Lines	0.00



## **I. Introduction**

Senate Bill (SB) 603, passed in the 2001 Legislative Session, mandates the development of a Land Use Master Plan (LUMP) by counties with surface mining operations. The creation of a LUMP would facilitate the development of economic or community assets, secure developable land and infrastructure, and ensure that post-mining land use proposed in any reclamation plan is in compliance with the specified land use in the approved LUMP. In order to promote acceptable principles of smart growth within the desired community it has become evident that a sustainable land use plan is needed to determine development needs within a community. The detailed document addresses the physical development needs of properties within the coalfield counties and provides guidelines, strategies, and a framework for future decisions relating to land use and projected community needs.

The 1977 Surface Mining Control and Reclamation Act established a program for the regulation of surface mining activities and the reclamation of coal-mined lands. The Act requires that coal operators minimize the disturbance and adverse impact on the environment and community in addition to restoring the mined property to its approximate original contour. Special provisions are granted for operators who offer development plans for post-mining land use, in which the coal operators (private sector) make capital investments towards land development that would benefit the community (public sector) affected by the mining operations. This unique opportunity, also known as Public-Private Partnership (P3), has far-reaching consequences on those communities with coal mining operations. The operators utilize the LUMP, created by the county officials with post-mine land use in mind, to gain insight into the land and infrastructure needs of the local community and then materialize the development opportunities described in the LUMP. The LUMP leverages private investment to facilitate public development, which is critical to the sustainability of counties and communities. Community sustainability requires a transition from poorly managed land to land-use planning practices that create and maintain efficient infrastructure, ensure close-knit neighborhoods and sense of community, and preserve our natural systems.

RTI, a nationally recognized center of excellence for rural transportation research, was established through the Transportation Equity Act for the 21st Century passed by Congress in 1998 and is funded through a grant from the Research and Innovative Technology Administration (RITA) of the US Department of Transportation. As a University Transportation Center, RTI has cultivated relationships with private industry and public agencies to leverage resources, technology and strategic thinking to improve mobility and to stimulate economic development. RTI has taken the lead in conducting site-specific research, supporting multimodal planning and analysis to improve mobility and global connectivity for rural regions. The Office of Coalfield Community Development (OCCD) was created by the 1999 Legislative Session to assist communities affected by surface mining activity throughout the State. With the passage of SB 603 in 2001, the responsibilities of the OCCD changed to include working with local economic development agencies to develop land use master plans and include the

recommendations of local economic redevelopment authorities in the reclamation plans of surface mine permits. The OCCD established criteria to consider development of these sites, provided for certain land uses as post-mining land uses and stipulated that master plans must comport to environmental reclamation requirements. The office allows existing and future surface mining permits to include master plan criteria and reclamation standards.

This plan provides information and analysis specifically for Upshur County. Upshur County's population growth is atypical of many coalfield counties, the economy is fairly diversified, and there is active play in the energy industry. However, educational issues persist, some of the economic sectors may not be suitable in the long-term, and no post-mine land development currently occurs. This plan will put focus on these issues, encouraging an analysis of the range of options available to policymakers.

## **II. Planning Area**

Upshur County was formed in 1851, twelve years before West Virginia became a state. It was formed from parts of Randolph, Lewis, and Barbour counties. Railroads and timbering were the major industries in the county, but coal also contributed a great deal, both positively and negatively. In 1907, the worst mining disaster in county history took the lives of twelve men at Lorentz. Strip mining and large deep mine operations have continued in the county, the effects of which may be mitigated by developing these sites. As with many of the coalfield counties, the boom from natural resource extraction brought people and money to the area, but through the Great Depression and the withdrawal of many natural resource industries, Upshur began to slip.<sup>1</sup>

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<sup>1</sup> Kirk, Brandon Ray, "Upshur County," *The West Virginia Encyclopedia*, Accessed June 5, 2013, [www.wvencyclopedia.org/articles/842](http://www.wvencyclopedia.org/articles/842).

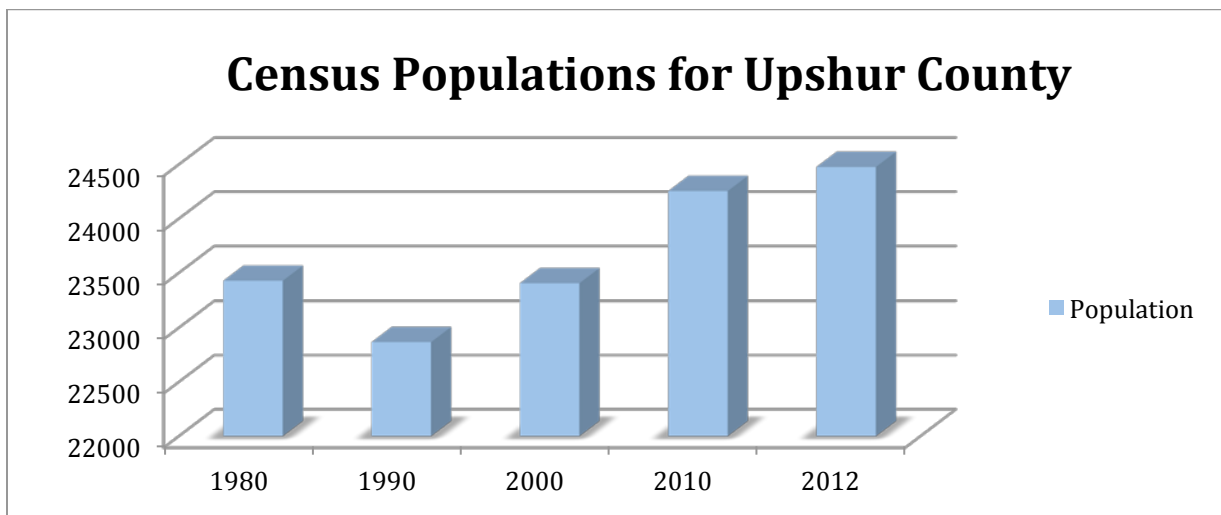
### III. Existing Conditions

This information will provide a background understanding of the demographic trends in the county. This base information is meant to provide overall detail on Upshur County's status as it stands. Part IV will deal with possible future site development information, to be considered with the demographic data to target strategies for investment.

#### Population

The population of Upshur County in 2011 was 24,096 according to the 2011 American Community Survey (ACS) 5-year estimates, ranking it 27<sup>th</sup> in county population among the 55 counties in West Virginia.<sup>2</sup> The decennial censuses show that Upshur County had a drop in population between 1980 and 1990, similar to the rest of the state, but has since recovered, and now continues to increase. This could be from the generation of opportunities provided by West Virginia Wesleyan College and proximity to centralized business areas like Clarksburg, Fairmont, and Morgantown.

**Figure 1**

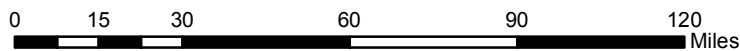
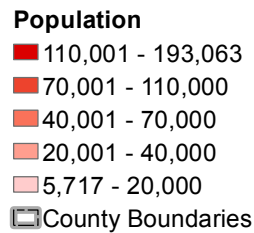
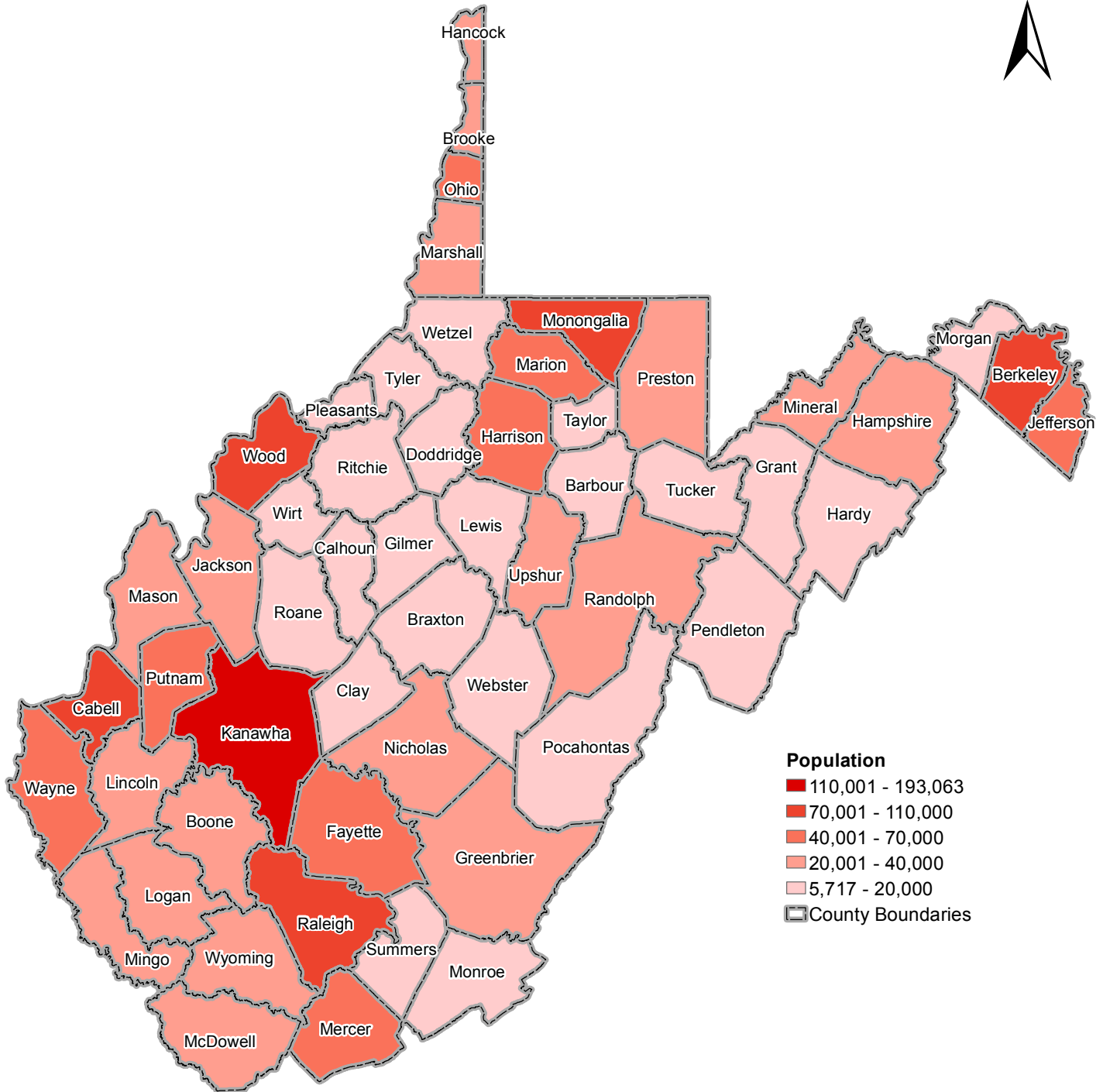


Source: Stats Indiana, USA Counties in Profile

Map 1 illustrates the Upshur County population compared to West Virginia overall. Upshur is at the lower end of the spectrum but is not as rural as many other counties in central and eastern West Virginia.

<sup>2</sup> United States Census Bureau, "2011 American Community Survey 5-year Estimates," Accessed April 20, 2013, [www.factfinder2.census.gov](http://www.factfinder2.census.gov)

# Demographic Population



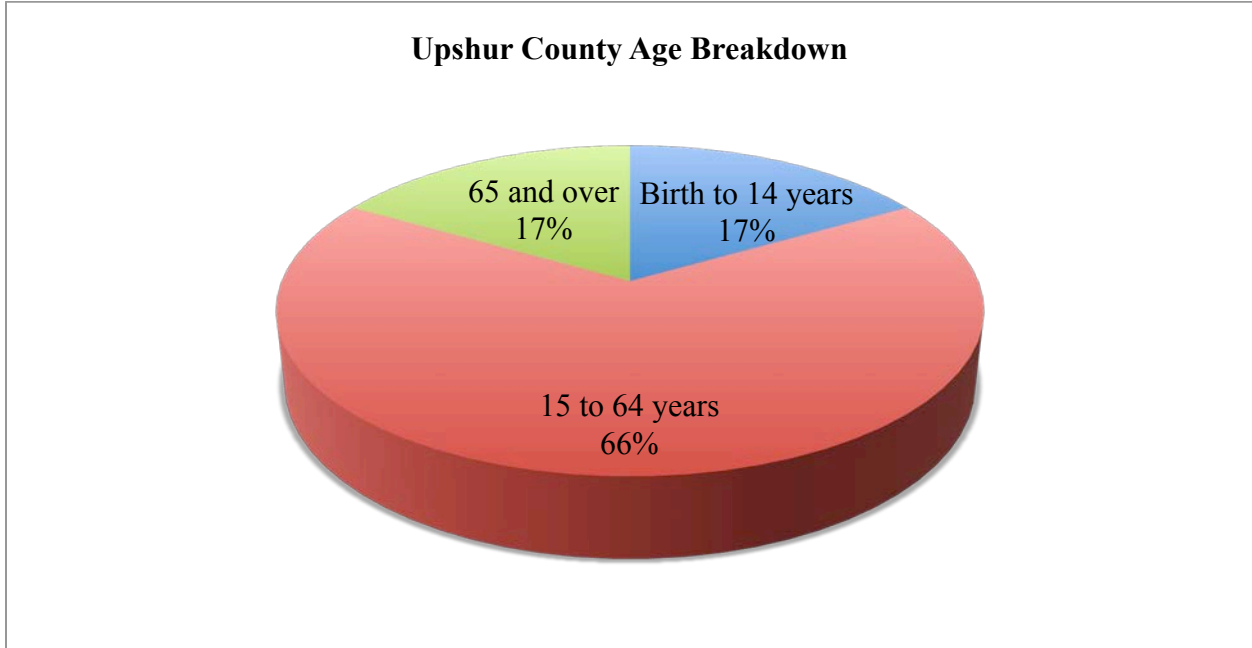
Source: United States Census Bureau 2011

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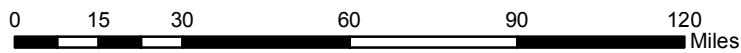
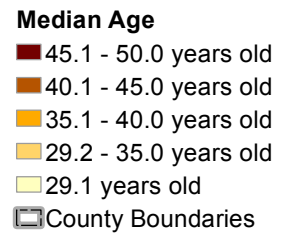
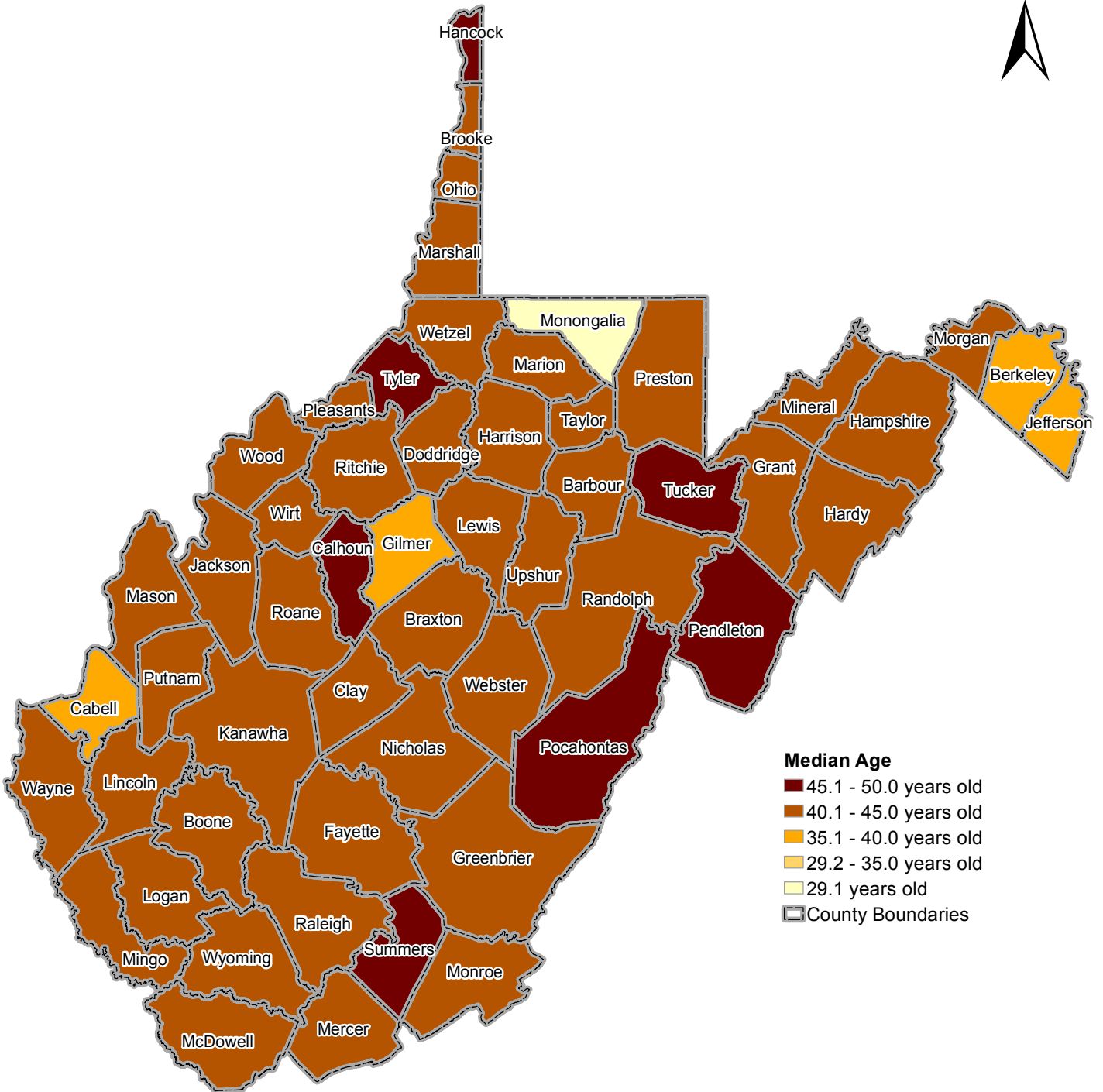
According to the ACS, almost a quarter of Upshur County residents are 60 years of age and over, while almost 15 percent are between 5 and 17 years of age and almost 6 percent are below the age of 5. As a result, approximately 5,500 people are of retirement age. The median age in Upshur is 41.5, which is the same as the West Virginian median age (Map 2). The majority of the population is of working age, as denoted in Figure 2.

**Figure 2**



Source: 2011 American Community Survey 5-Year Estimate Calculation

# Demographic Median Age



Source: United States Census Bureau 2011

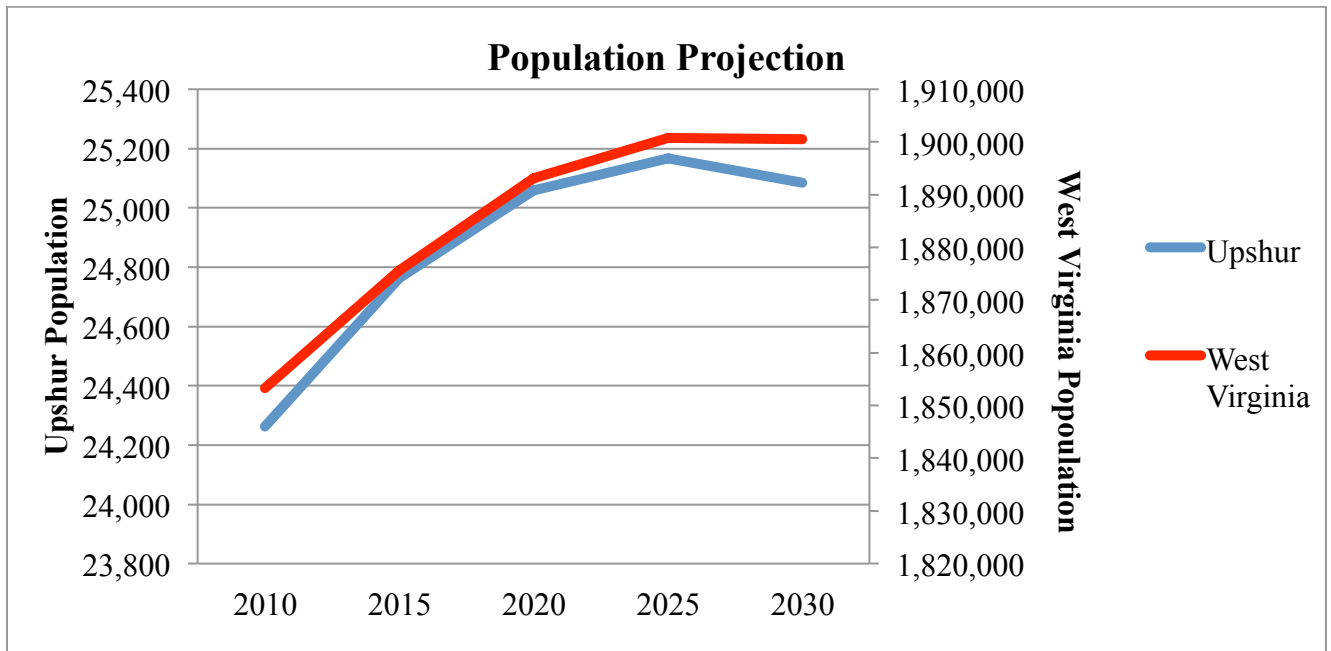
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The Bureau of Business and Economic Research at West Virginia University projects a 3.4 percent increase in the Upshur County population between 2010 and 2030, which is very similar to the projected growth of West Virginia.<sup>3</sup> The model for the projection is based on past population patterns and statistics, and should not be taken as permanent. The increase is consistent with the increase in Upshur County’s population over the past two decades.

**Figure 3**



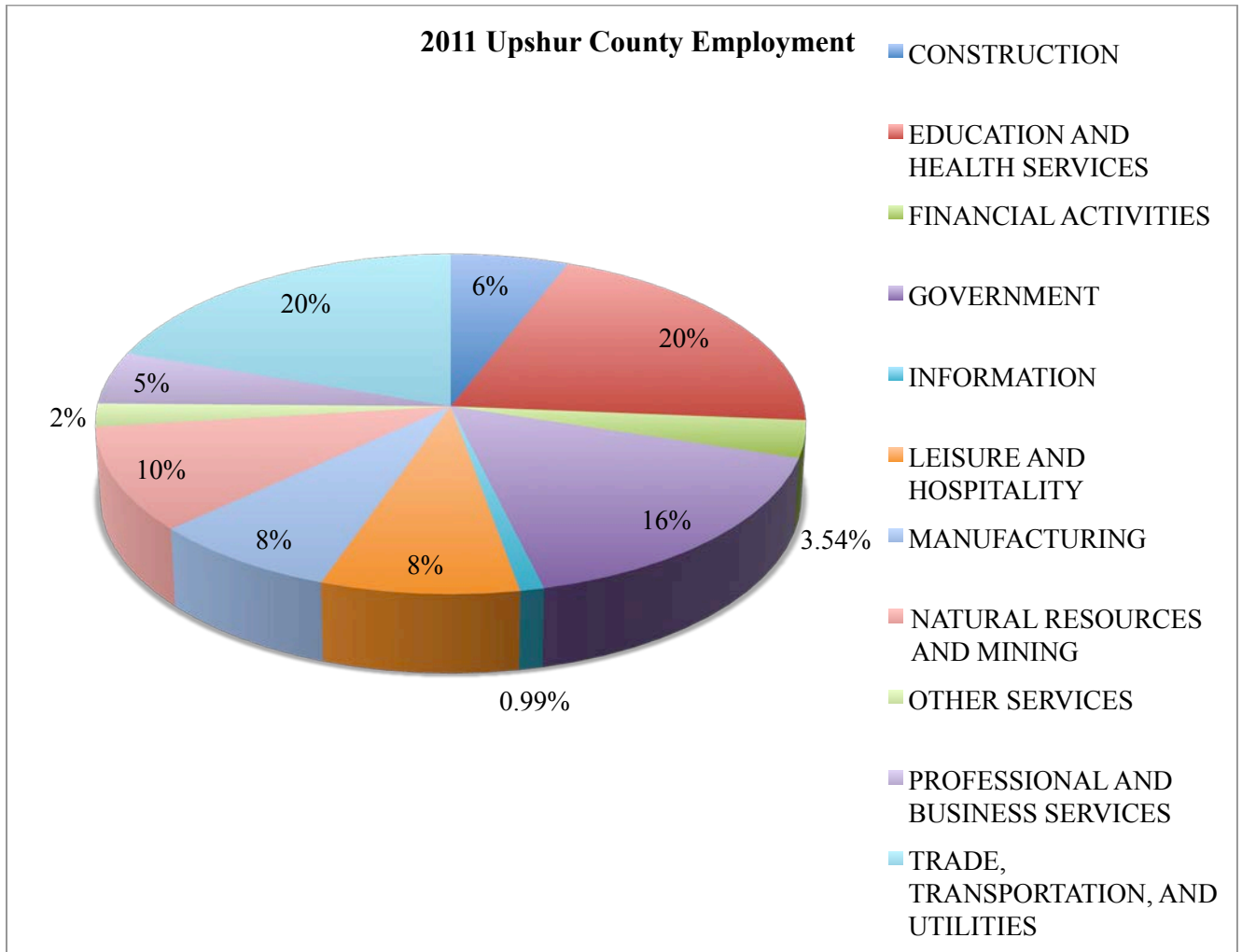
Source: WVU Bureau of Business and Economic Research

**Employment**

Workforce WV has a complete dataset on employment numbers and wages. The total number of employed in 2011 was 8,176. Employment is split almost evenly among three main employers: Trade, Transportation, and Utilities; Education and Health Services; and Government. Upshur County government employment is consistent with West Virginia employment patterns as a whole, but Upshur’s is lower than other coalfield counties. This makes Upshur County slightly less susceptible to political budget-cutting, and makes the economy more diversified than others.

<sup>3</sup> Christiadi. “Population Projection for West Virginia Counties.” Bureau of Business and Economic Research, College of Business and Economics, West Virginia University, Morgantown, WV (August 2011).

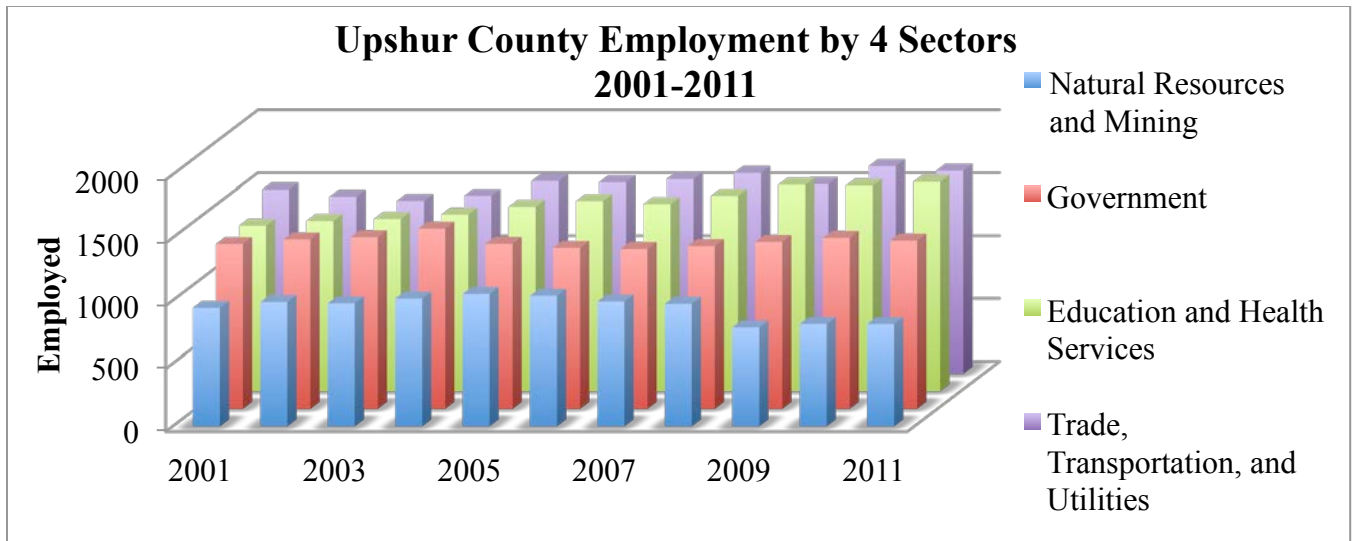
**Figure 4**



Source: Workforce WV

Four sectors have been the major contributors to employment throughout the past decade: Government; Education and Health Services; Trade, Transportation and Utilities; and Natural Resources and Mining. The Trade, Transportation, and Utilities sector and Education and Health Services have risen very similarly over the decade, both being the primary employer in different years. Government services employment has been fairly steady.

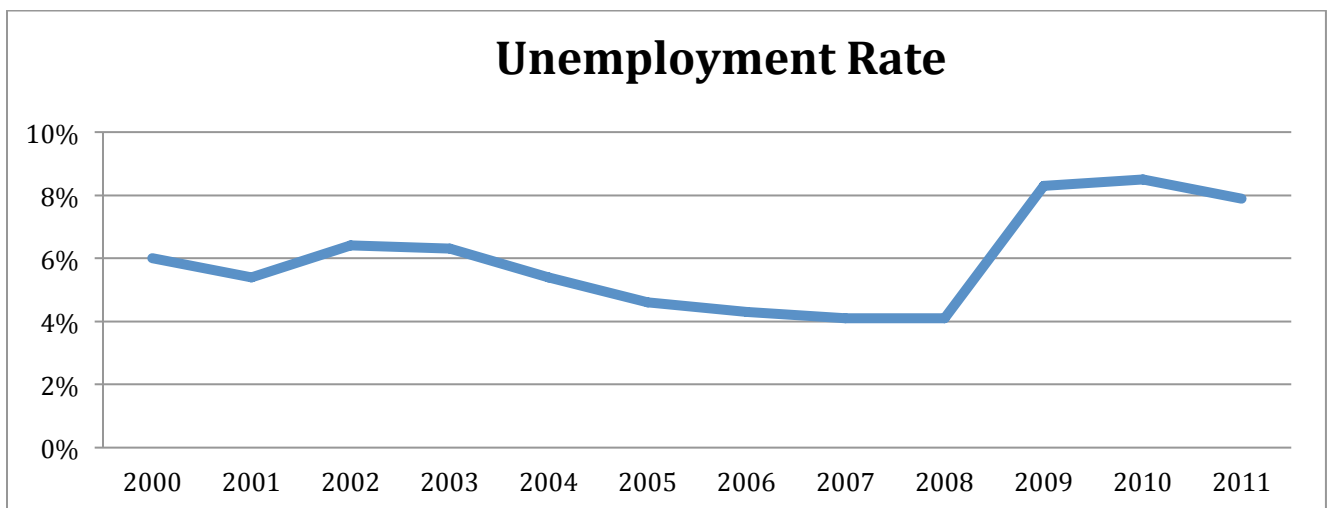
**Figure 5**



Source: Workforce WV

The civilian labor force in the county is one of the most interesting statistics when determining potential investors. As Map 3 shows, Upshur's participation rate is at the upper end of the scale. This shows a relatively engaged labor force for a coal producing county. Unemployment was decreasing until the recession in 2008 (Figure 6). The economy only slightly recovered in 2010, and the unemployment statistics continue to improve. Map 4 provides 2011 unemployment rates for Upshur compared with the rest of the State.

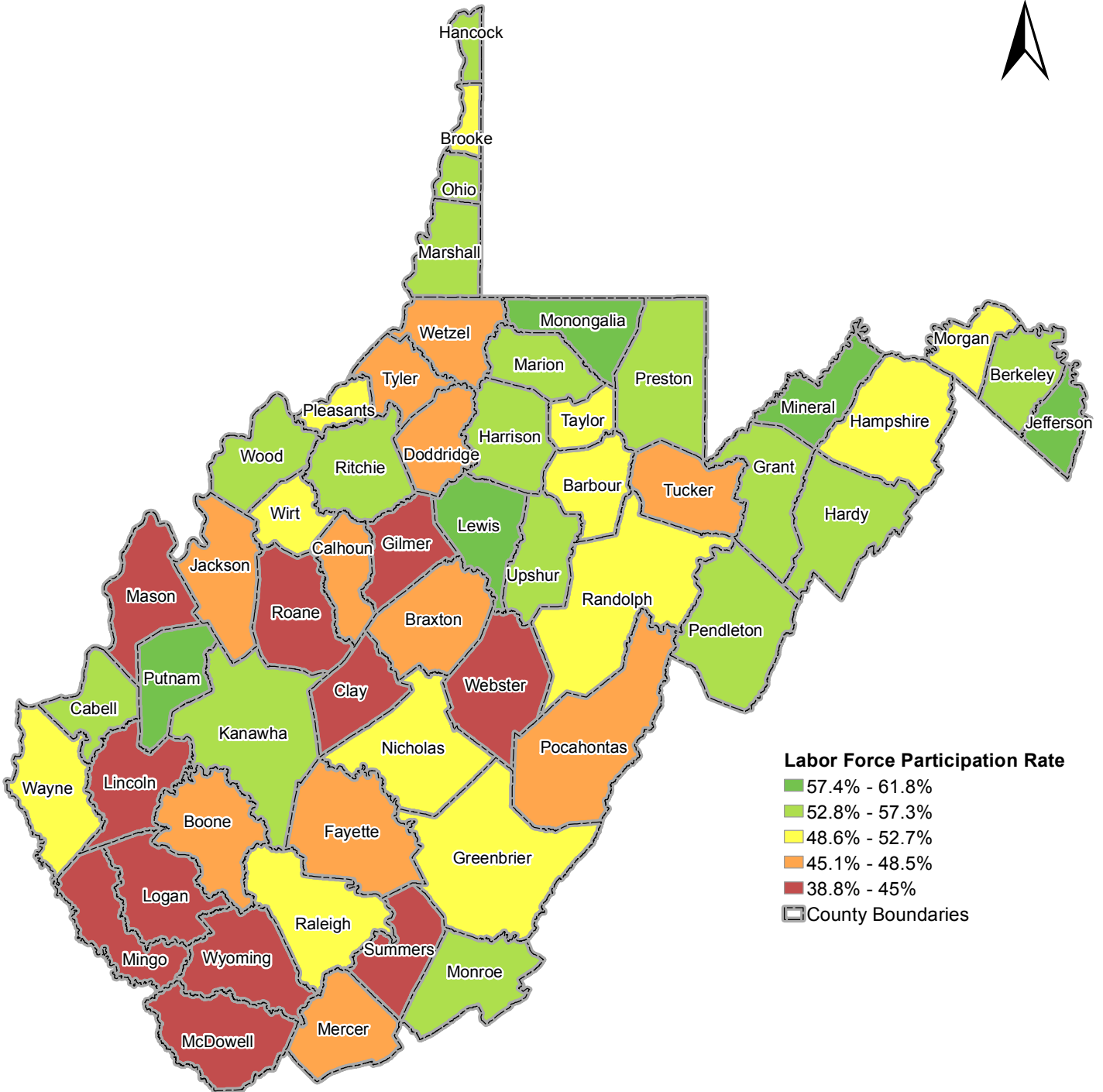
**Figure 6**



Source: Workforce WV

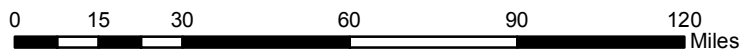
# Demographic

## Labor Force Participation Rate



**Labor Force Participation Rate**

- 57.4% - 61.8%
- 52.8% - 57.3%
- 48.6% - 52.7%
- 45.1% - 48.5%
- 38.8% - 45%
- County Boundaries

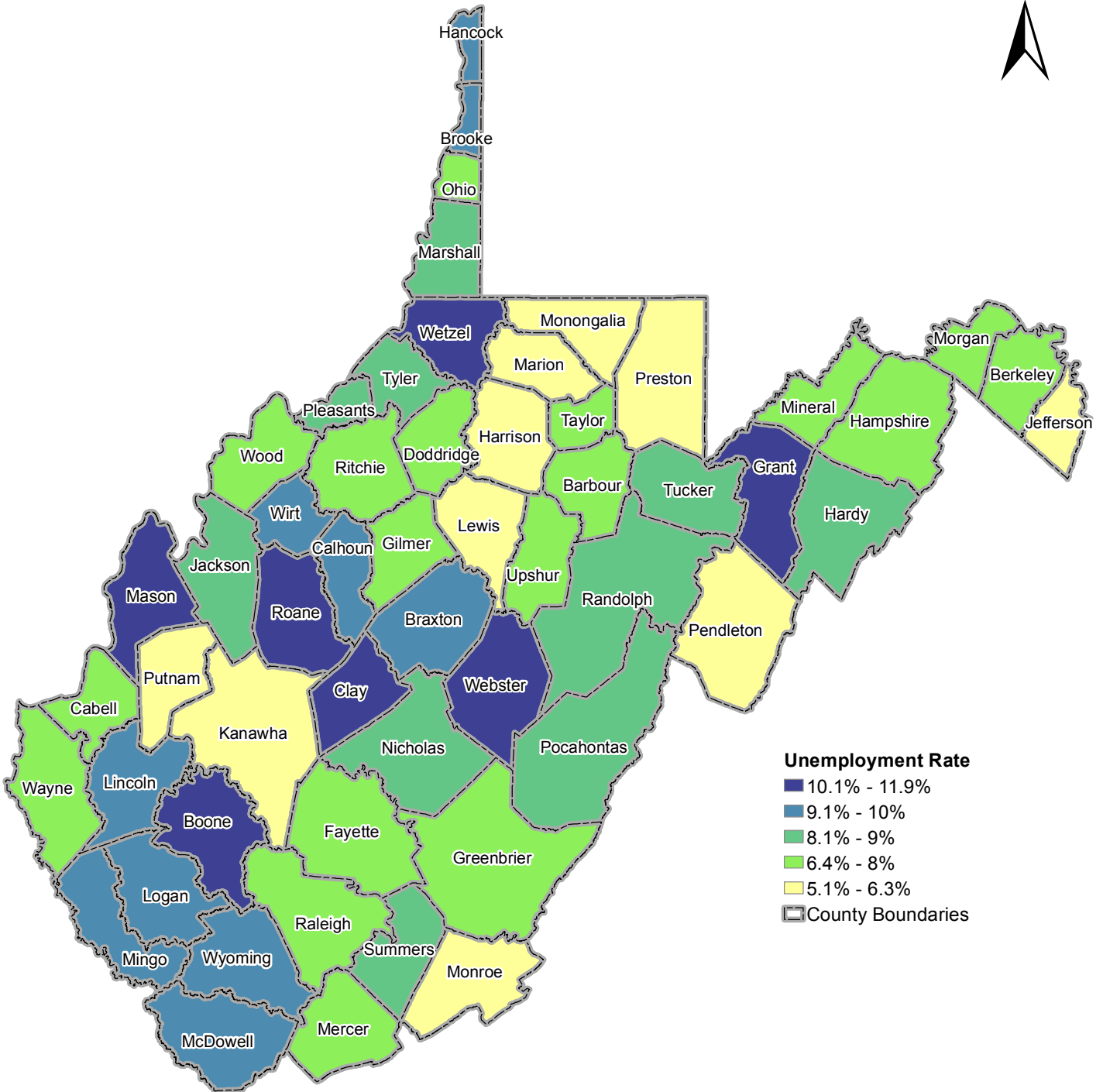


Source: Workforce WV 2011

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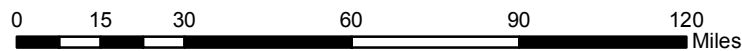
**RTI**  
RAHALL APPALACHIAN  
TRANSPORTATION INSTITUTE  
[www.njrati.org](http://www.njrati.org)

# Demographic Unemployment Rate



**Unemployment Rate**

- 10.1% - 11.9%
- 9.1% - 10%
- 8.1% - 9%
- 6.4% - 8%
- 5.1% - 6.3%
- County Boundaries



Source: Workforce WV 2011

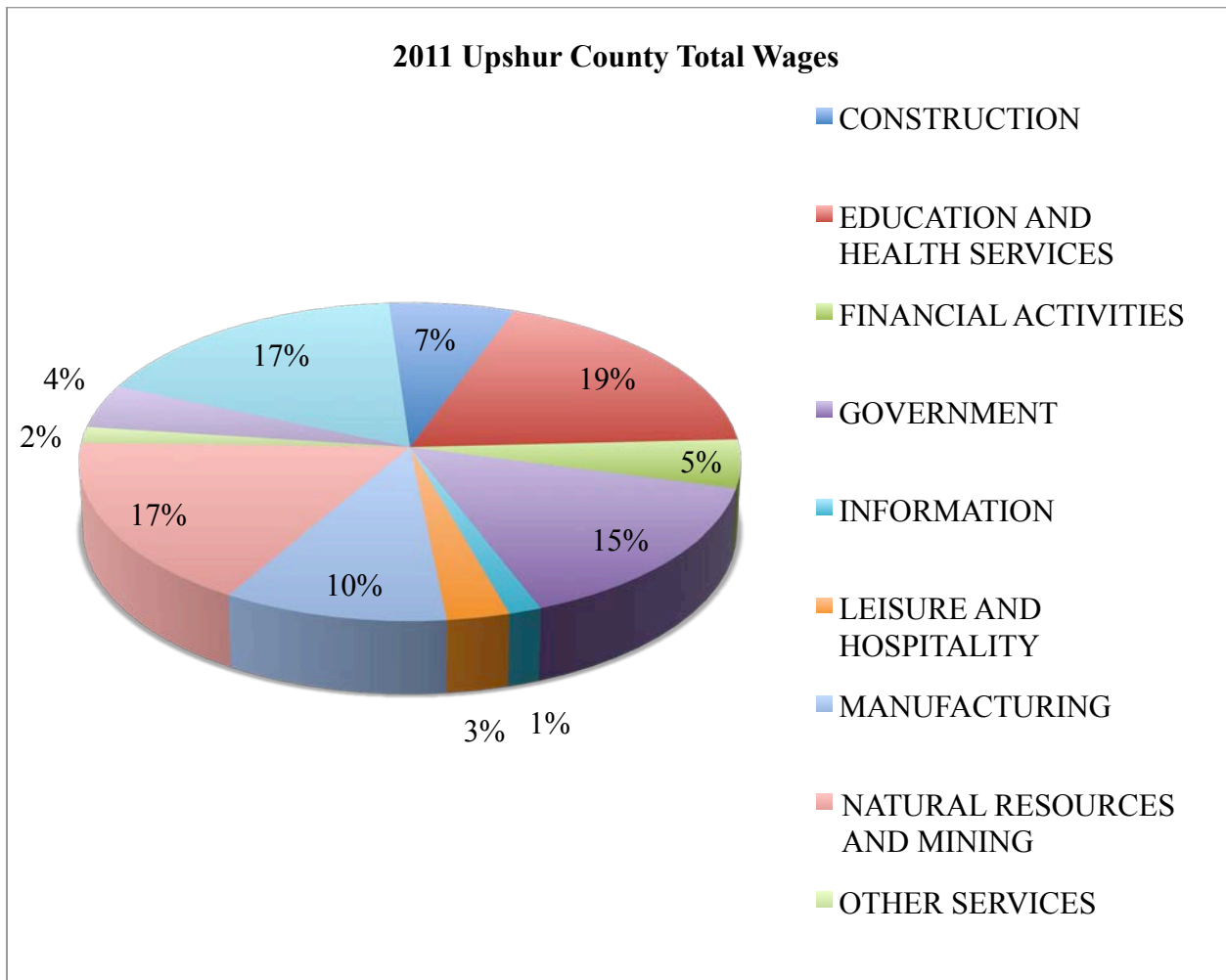
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## Wages and Income

Upshur County's wage contributors vary in the level of contribution. The highest, Education and Health Services, is because of the level of employment it provides (Figure 7). Natural Resources and Mining is much higher than its relation to employment would suggest because of the higher paying support activities in mining.

**Figure 7**

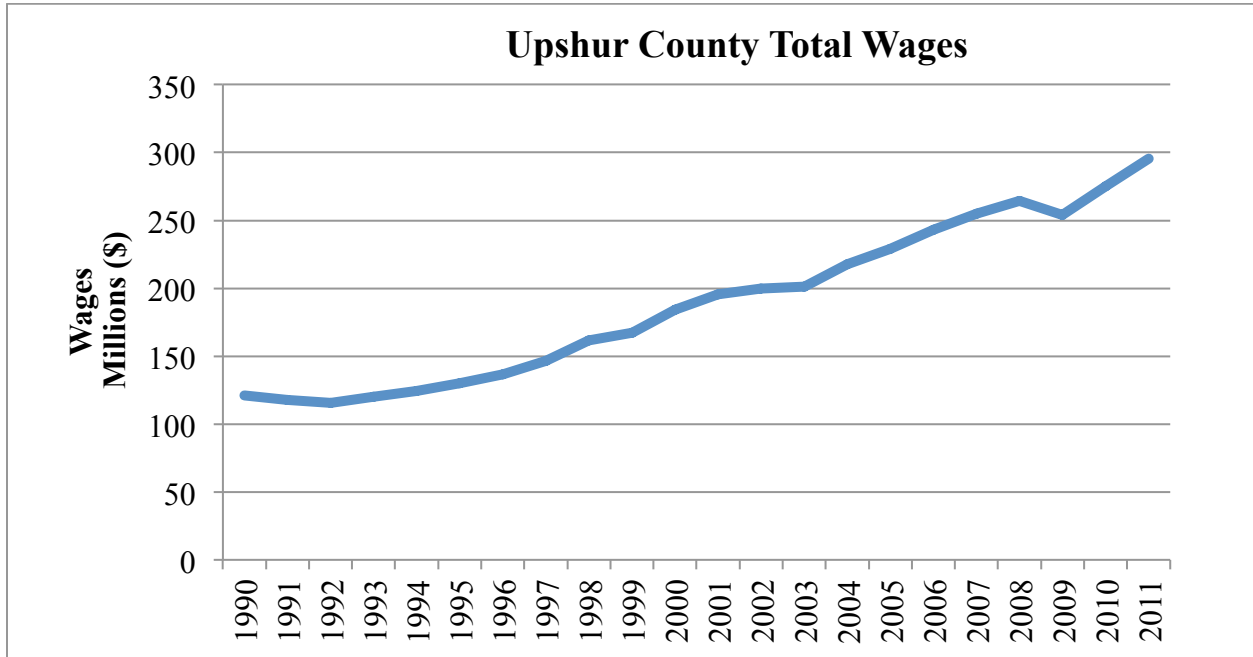


Source: Workforce WV

Historically, wages for Upshur County have shown a tendency to rise. Upshur County has managed to keep many of its major sectors' jobs, allowing for wages to rise despite recession and cost-cutting factors that led to an increase in unemployment in other sectors. Figure 8 shows total wages for Upshur County, which have consistently shown an upward trajectory. The rise in Trade, Transportation, and Utilities and Education and Health Services sector wages kept total

wages from falling during the recession. However, these two sectors are not entirely stable, as analysis in other counties has shown, and may not be able to sustain the economy indefinitely.

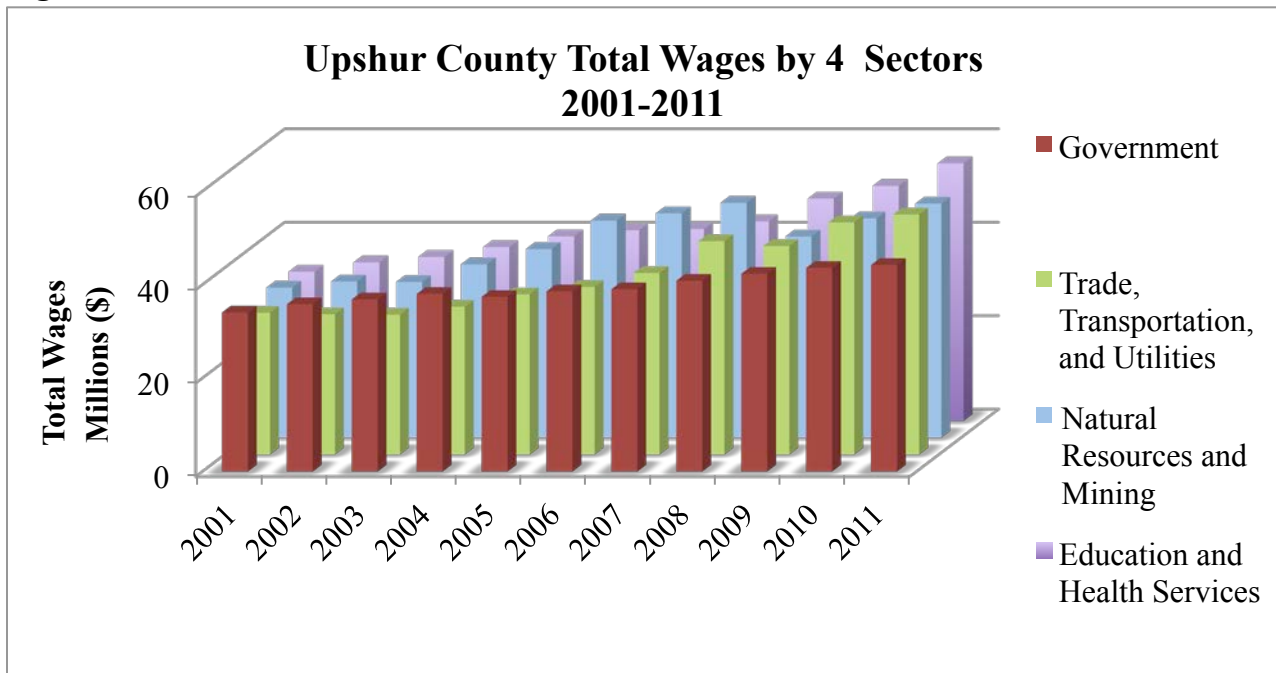
**Figure 8**



Source: Workforce WV

Figure 9 confirms the general trend in wages, also showcasing the dominance of two major sectors. Education and Health Services only overtook Natural Resources and Mining after the recession, but continues to be the dominant wage provider in Upshur County.

Figure 9



Source: Workforce WV

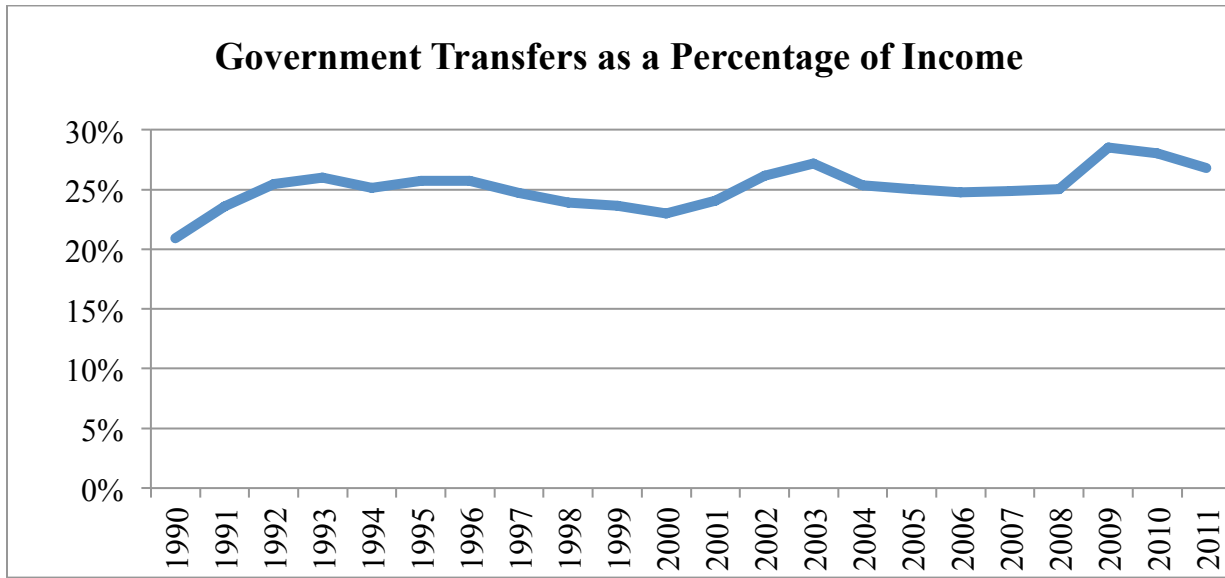
In most American counties, one would find that the majority of income for people stems from wages. In West Virginia, however, an important distinction must be made between income and wages. Income is the total receipt of earnings resulting from any economic activity, while wages are derived from actual work in an employed setting. Therefore, dividends from stockholdings are considered income, but not wages. In 2011, Upshur County wages were \$295 million for all industries.<sup>4</sup> Income for the County was larger (around \$700 million). Though there are many components to income other than work earnings, 27 percent of total Upshur County income is derived from government transfers.<sup>5</sup> Government transfers accounted for about 95 percent of total transfers to Upshur County, dwarfing transfers from private institutions such as charities. Upshur County has historically had just over a quarter of its income derived from government transfers

<sup>4</sup> "Employment and Wages – 2011, Upshur County," Workforce WV, Accessed February 13, 2013, <http://www.workforcewv.org/lmi/EW2011/ew11x059.htm>

<sup>5</sup> "Tables CA 04 and CA 35 analysis," Bureau of Economic Analysis, Regional Economic Accounts, Local Area Person Income and Employment, Accessed February 13, 2013, <http://www.bea.gov/regional/index.htm>.



**Figure 10**



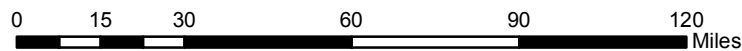
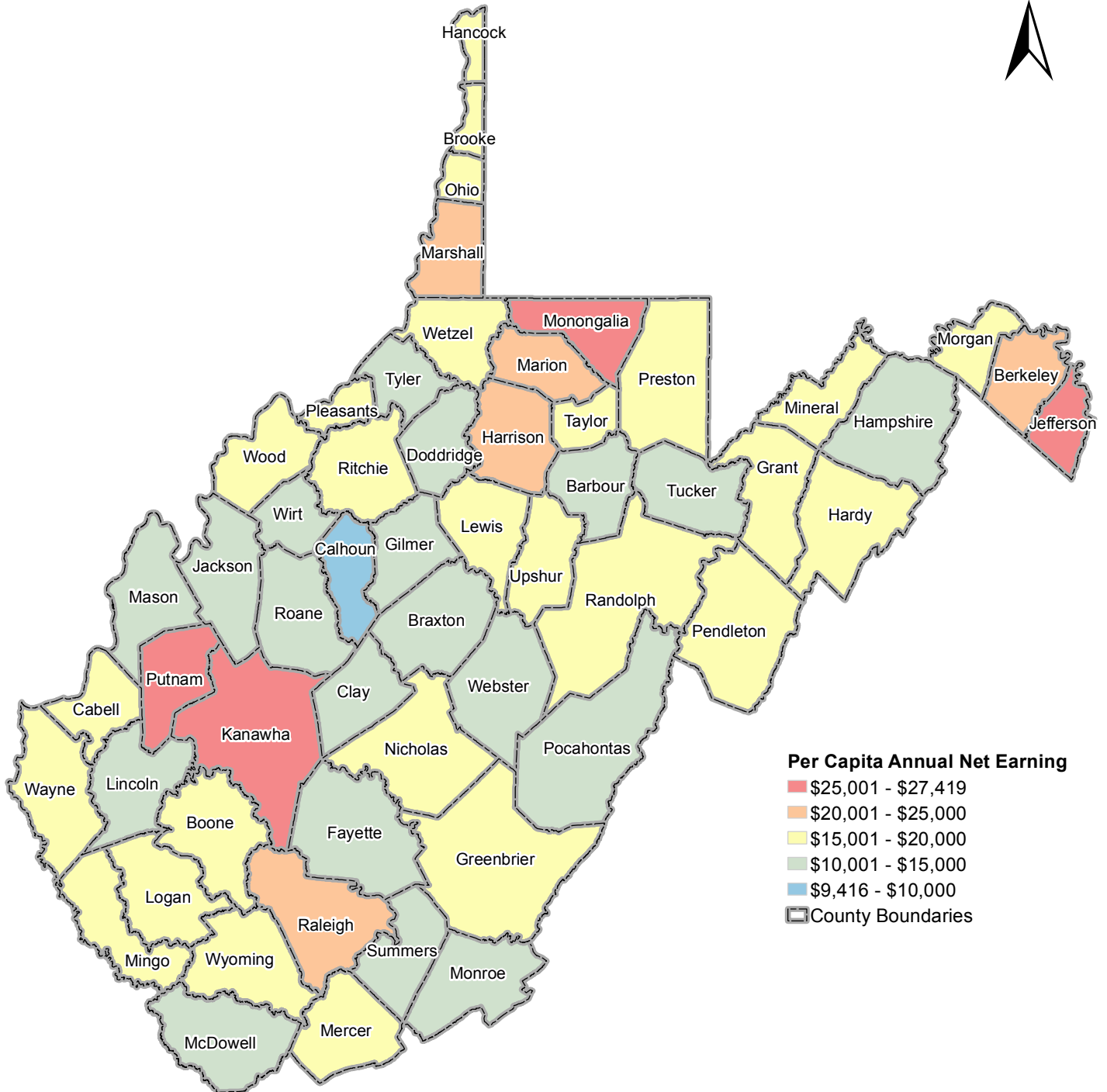
Source: United States Bureau of Economic Analysis

The total personal income of Upshur County is therefore made up of 27 percent government transfers and about 42 percent wages from work. Upshur County is thus equal to the state average in terms of government transfers and income. According to the BEA, per capita income was \$29,288 for Upshur County. Earned income, or income from work, is displayed in Map 5, and Upshur is about average in earned income in West Virginia.

Another measure of economic health is the number of establishments that do business in the area. Map 6 shows the number of establishments in each county in West Virginia. Upshur County appears to be at the lowest end of the spectrum. Some of the sectors, such as education and health services and government, may be characterized by a small number of firms, likely decreasing the number of establishments in the county.

# Demographic

## Per Capita Annual Net Earning



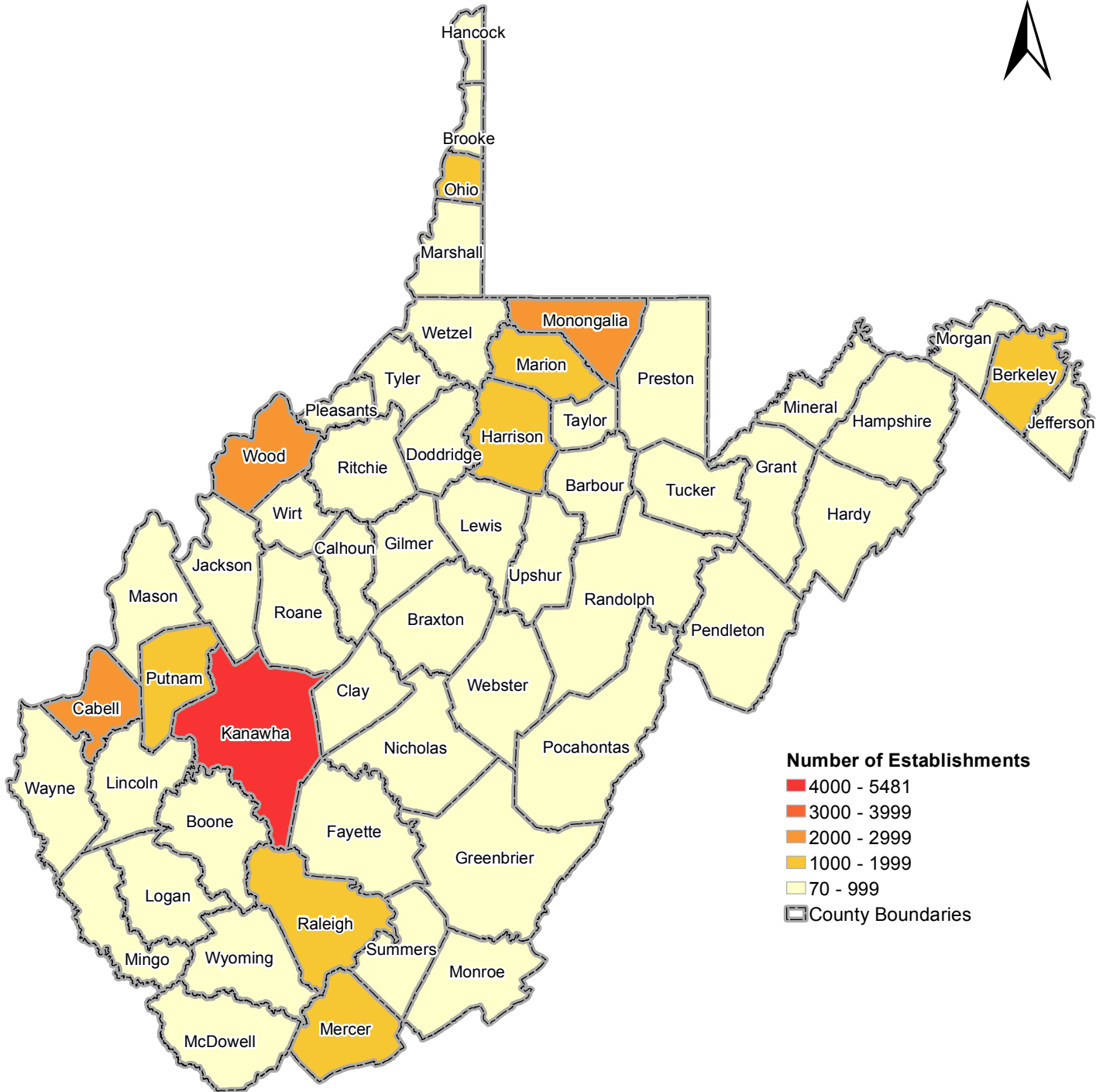
Source: United States Census Bureau 2011

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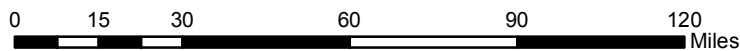
# Demographic

## Number of Establishments



**Number of Establishments**

- 4000 - 5481
- 3000 - 3999
- 2000 - 2999
- 1000 - 1999
- 70 - 999
- County Boundaries



Source: United States Census Bureau 2011

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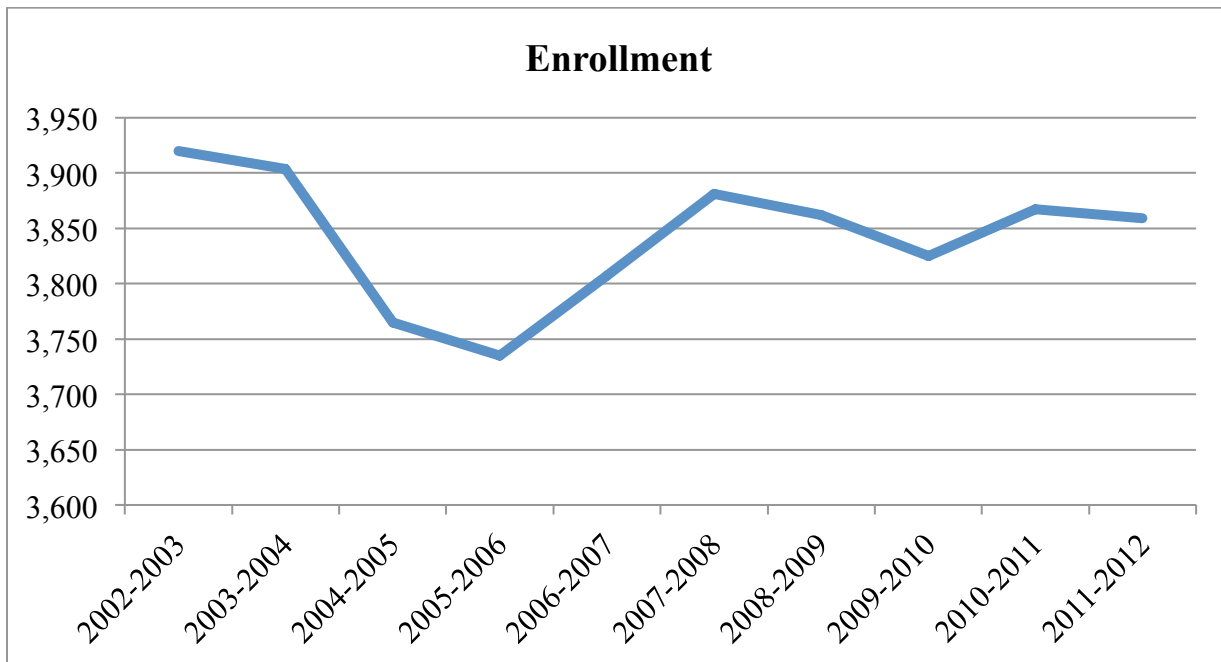


## Education

Upshur County has one high school, one middle school, and seven elementary schools as of the 2011-2012 school year.<sup>6</sup> Upshur County also contains a private four-year university, West Virginia Wesleyan College, which contributes to the education and development of the county.

Upshur County 2<sup>nd</sup> month school enrollment has been very erratic, but has relatively stabilized since 2007. Upshur County 2<sup>nd</sup> month enrollment is at the low end of the spectrum but greater than most counties in central and eastern West Virginia (Map 7).

**Figure 11**



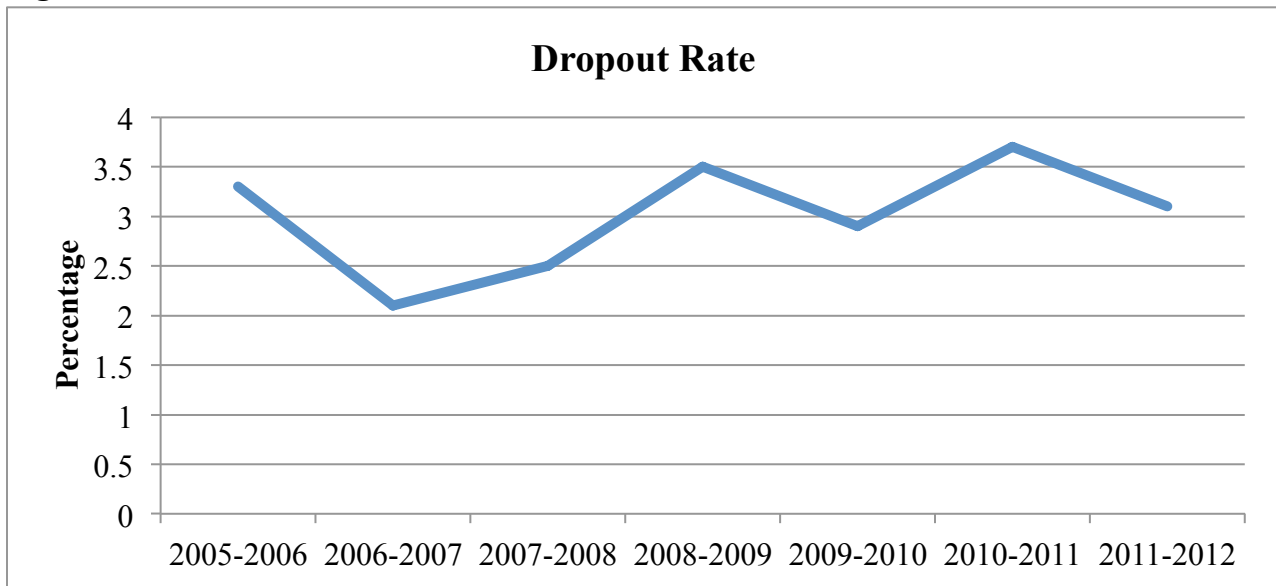
Source: WVEIS

The West Virginia Education Information System (WVEIS) also has dropout rates for the school years from 2005 to 2012. Dropout rates for grades 7-12, which showcase the most likely time for school dropouts, do not follow the total enrollment statistic, as total enrollment is computed with the grades below 7<sup>th</sup> grade as well. Dropout rates have incrementally risen since 2006, as students have been taking jobs in steadily growing industries where less education may be needed. (Figure 12).

---

<sup>6</sup> “School Profiles,” West Virginia Education Information System, West Virginia Department of Education, Accessed February 13, 2013, [http://wveis.k12.wv.us/nclb/profiles/c\\_profile.cfm?cn=043](http://wveis.k12.wv.us/nclb/profiles/c_profile.cfm?cn=043).

**Figure 12**

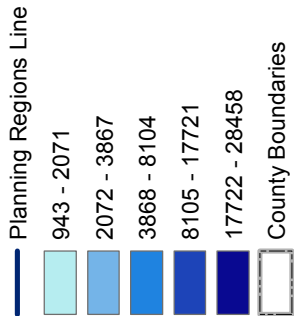
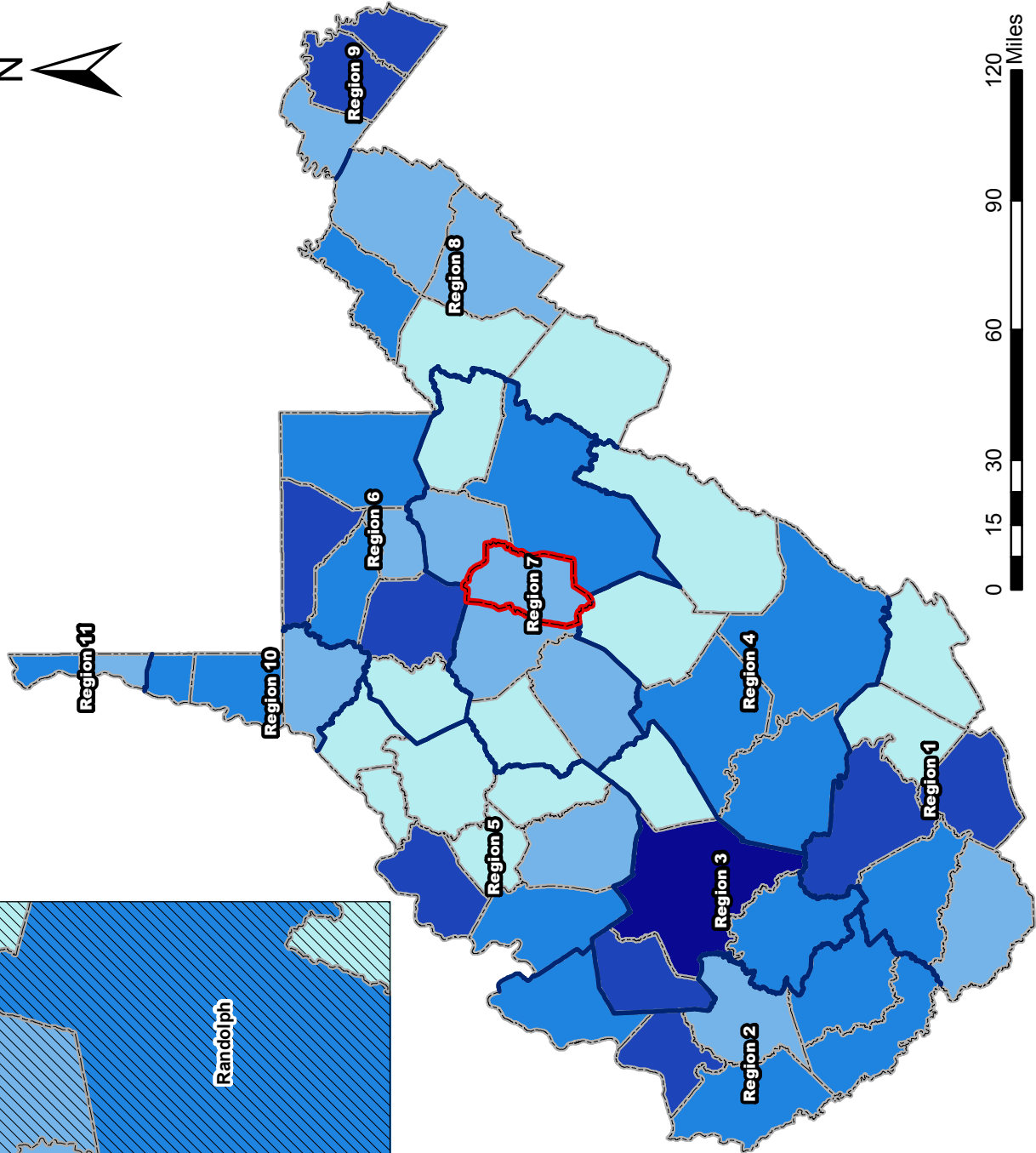
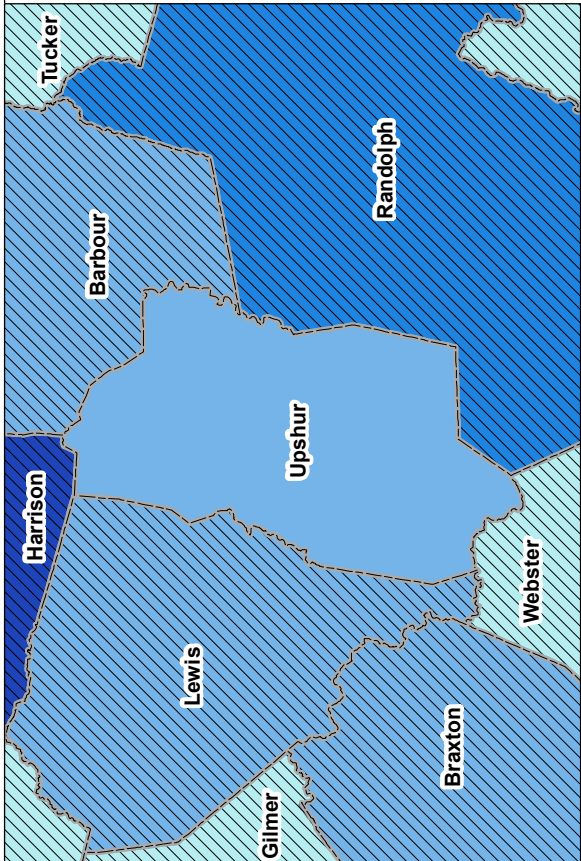


Source: WVEIS

Upshur County's dropout rate is one of the highest in the state. This is concerning for the future growth of the county. Map 8 shows each county's dropout rate. Maps 9 and 10 show the total graduates and the graduation rate by county. The number of graduates in Upshur County is slightly higher than those of the counties in the north-central area of West Virginia. The graduation rate is at the lowest end of the scale. Upshur County has several schools with large attendance; their locations are noted in Map 11. Not coincidentally, the major schools are located on the main roads in the county. The largest school by attendance in the county is Buckhannon Upshur High School. The significance of the locations of these schools is the access to major transportation routes. The schools appear to be built in order for parents and students to maintain steady access, which is important to discourage dropping out and to maintain attendance levels.

# NCLB - Second Month Enrollment

Upshur County



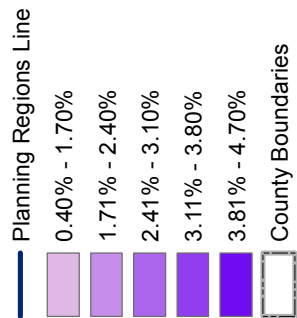
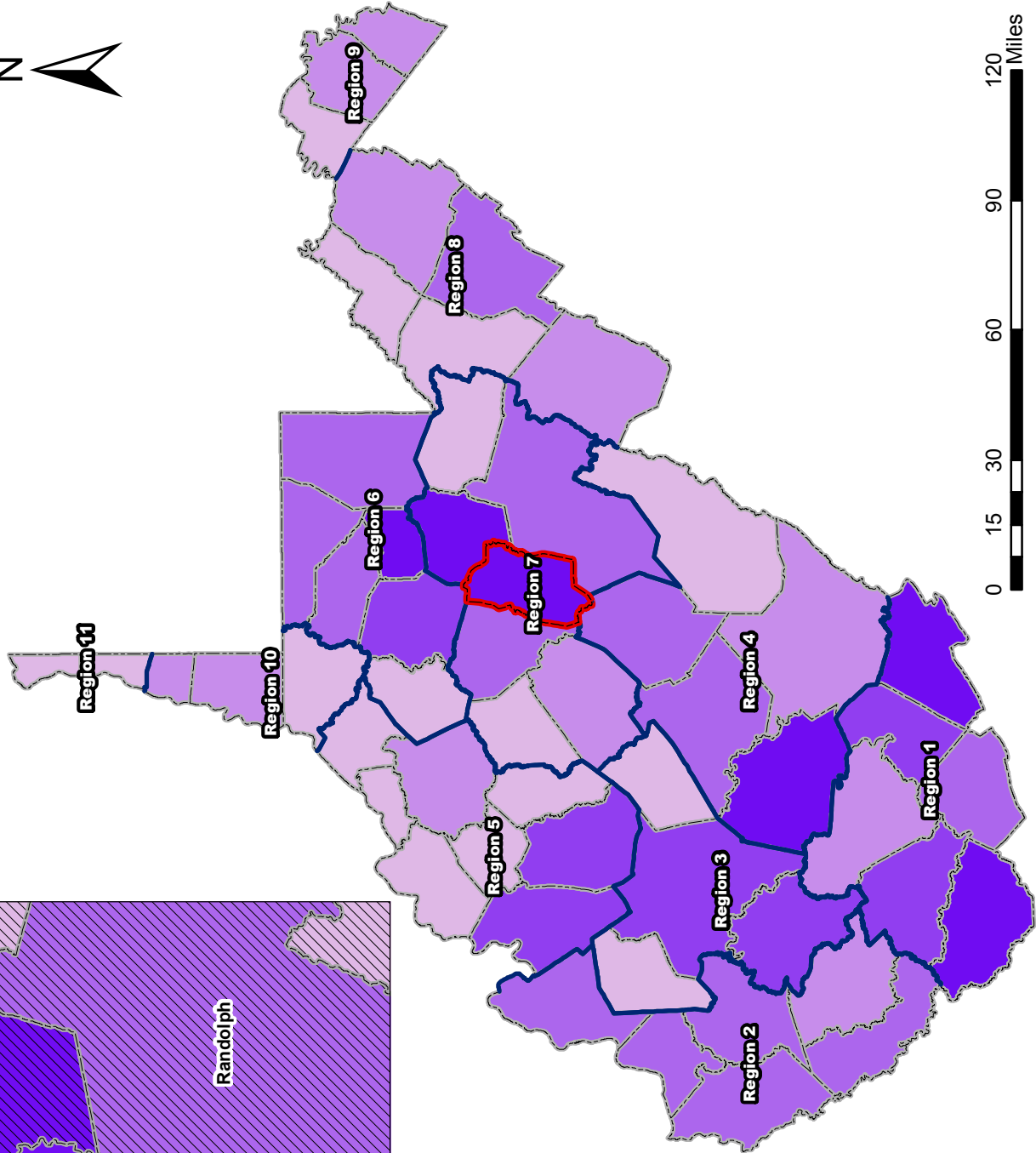
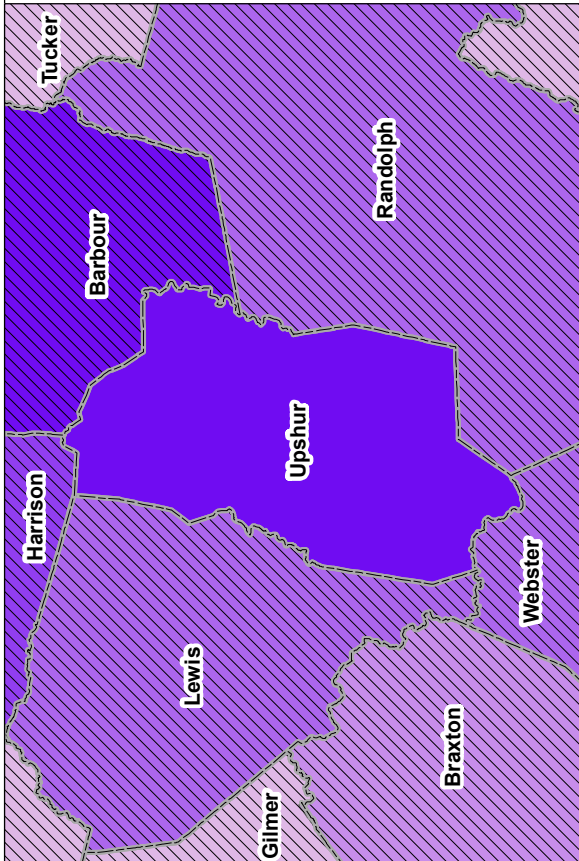
Source: West Virginia Department of Education 2012

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# NCLB - Dropout Rate

## Upshur County



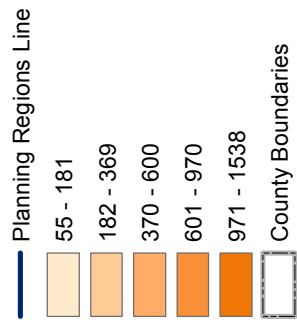
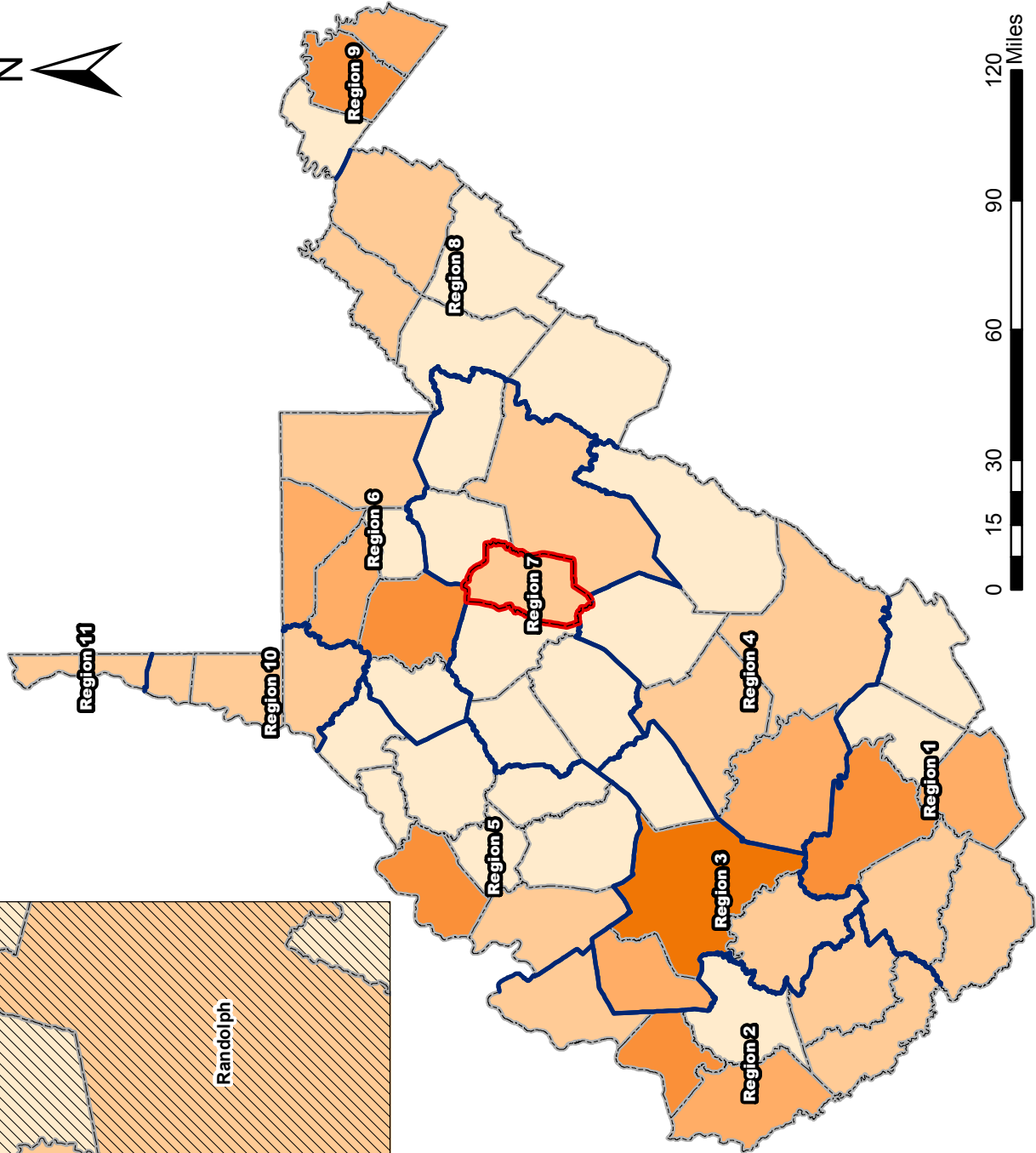
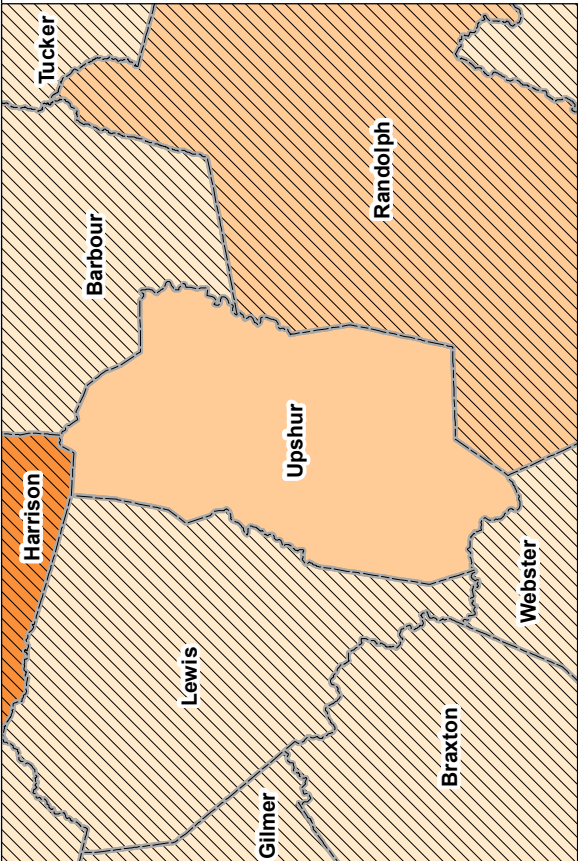
Source: West Virginia Department of Education 2012

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# NCLB - Total Graduates

## Upshur County



Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

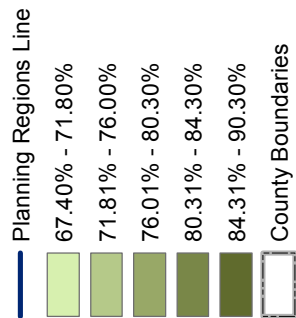
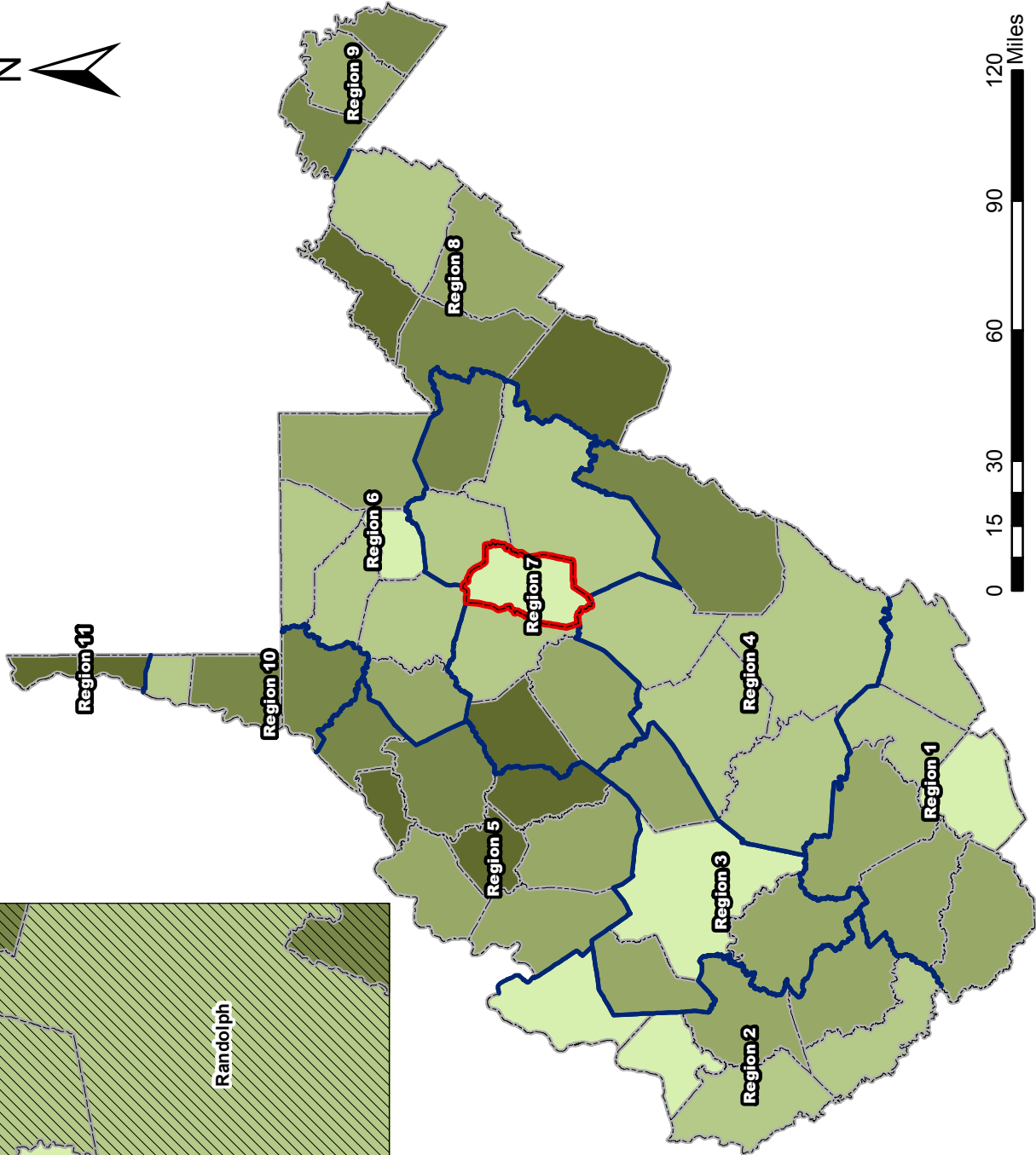
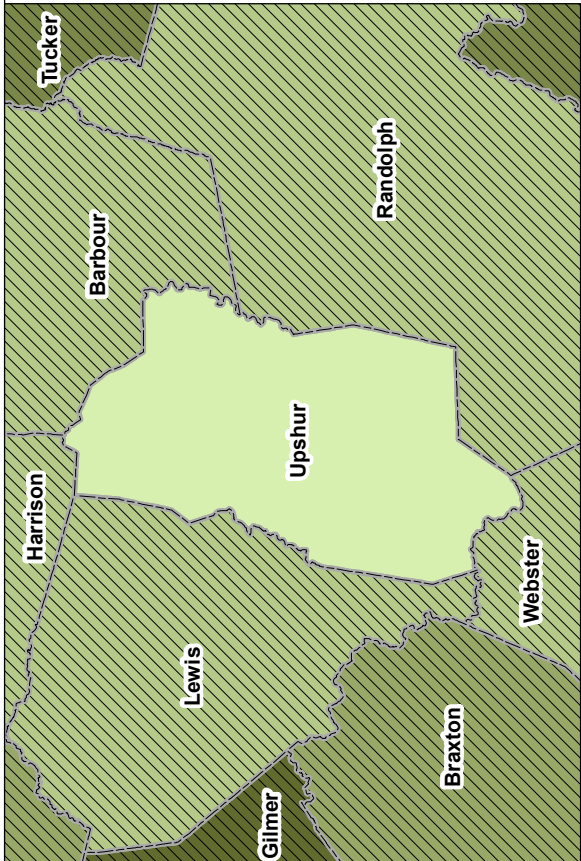
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# NCLB - Graduates Rate

Upshur County



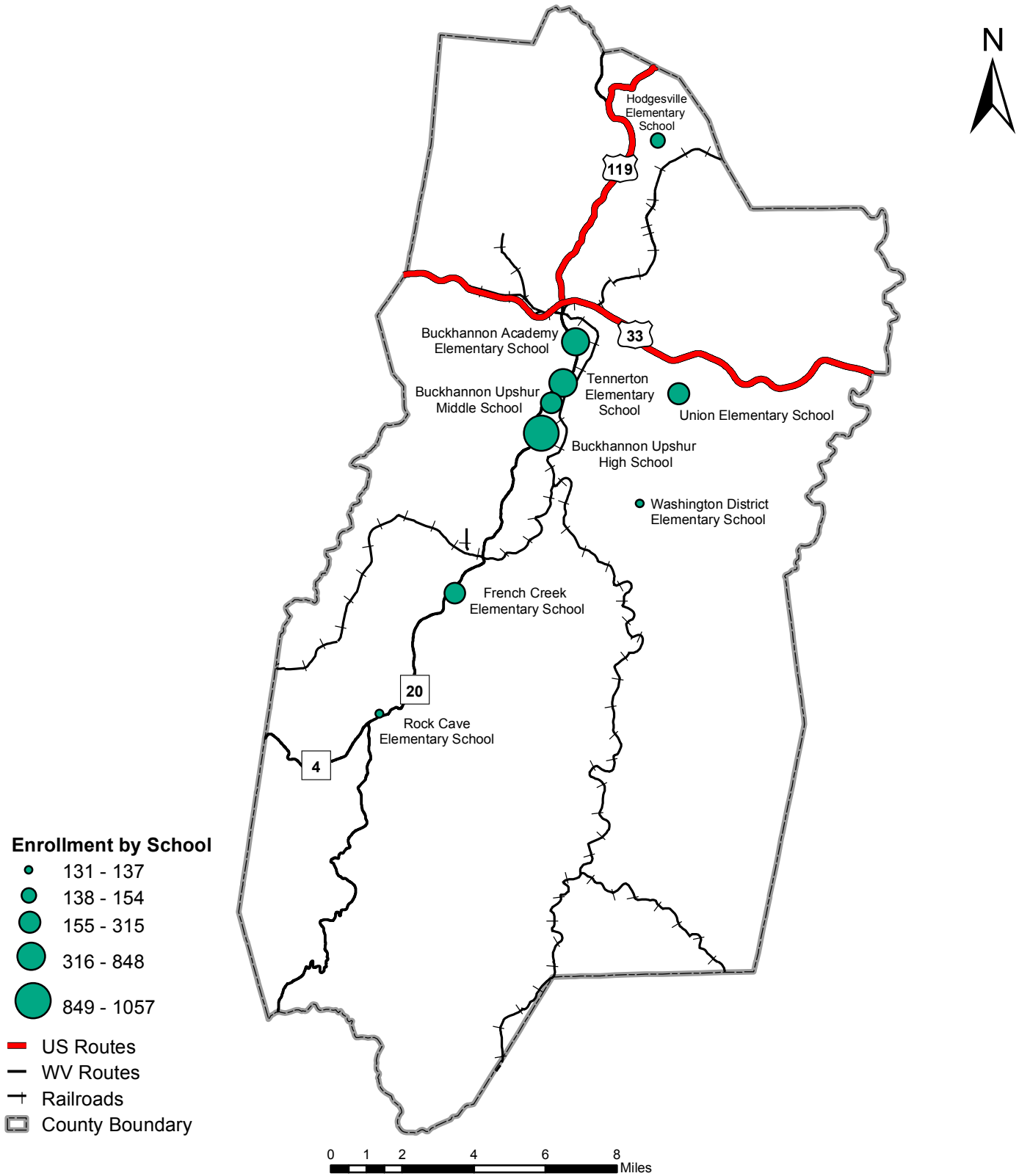
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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# Total Attendance by School - 2012

## Upshur County



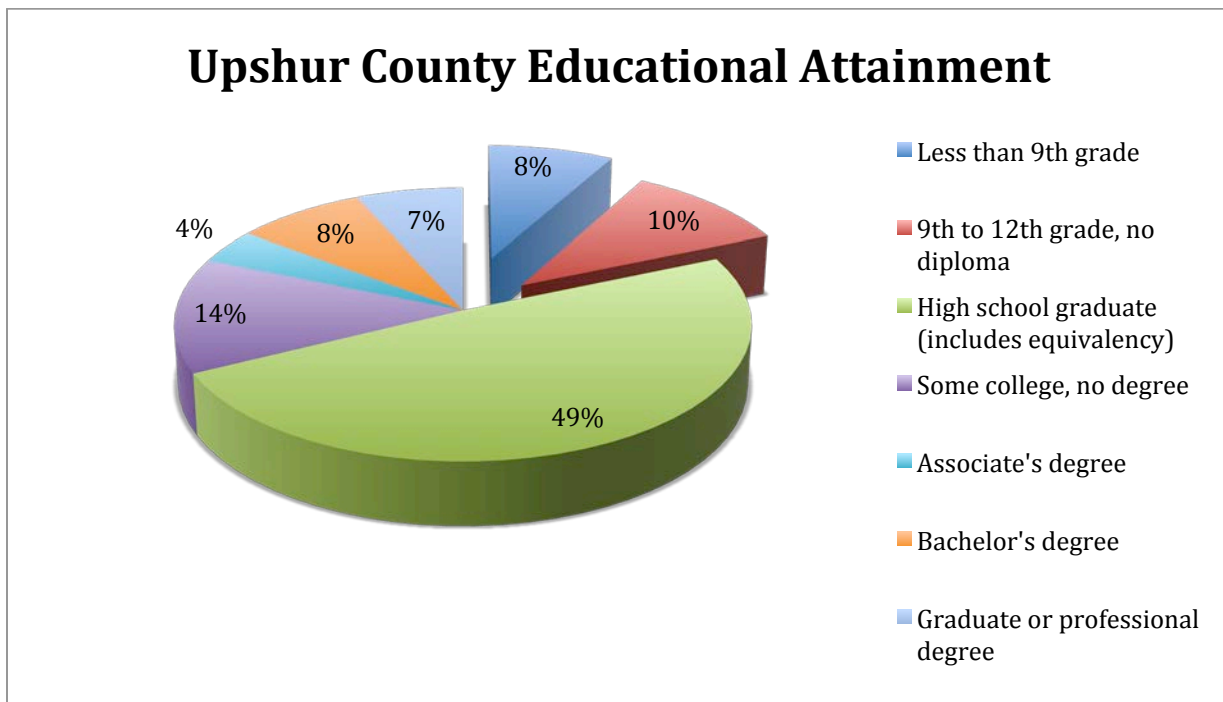
Source: West Virginia Department of Education 2012

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The ACS also maintains data on the educational attainment of the population that is 25 years and over. Forty-nine percent of these residents have a high school diploma or equivalent. However, 18 percent have less than a high school diploma. This is a rather high number and particularly concerning when the relationship between education and jobs is considered, but the 19 percent that have college degrees is a promising sign.

**Figure 13**



Source: 2011 American Community Survey 5-Year Estimates

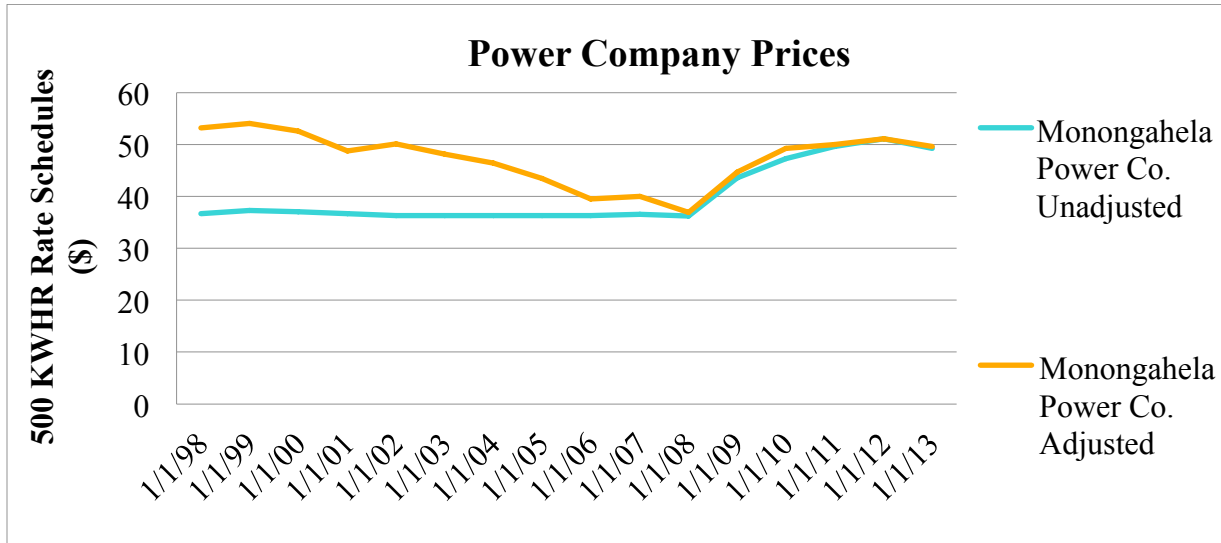
### **Utilities and Infrastructure**

Upshur County has 17 utility companies according to the West Virginia Public Service Commission (PSC). Economic development depends on infrastructure, and Upshur County has several providers of water and sewer, and two providers of electricity. Monongahela Power Company provides residential, industrial, and large-capacity service to Upshur County, as does the Harrison Rural Electrification Association, Inc.

The West Virginia Public Service Commission maintains tariff rates for all companies involved in providing utilities. Of particular importance are electricity tariffs; the monitoring of these tariffs is an ongoing project. To that end, the PSC observes the growth rate of tariffs and possesses a 20-year comparison based on the average residential utility rate of the State. This provides a significant overview of how electric prices behave in West Virginia as a whole. As Figure 14 shows, if the tariffs are not adjusted by the Consumer Price Index (CPI), it would appear that rates are constantly increasing. Viewing rates in such a manner would be a misunderstanding, and would be incorrect in reference to a State with the highs and lows of West

Virginia’s past. The Bureau of Labor Statistics has a CPI for electricity prices dating to 1998. The adjusted and unadjusted prices are provided in Figure 14. The PSC does not have comparisons for Harrison Rural Electrification Association, Inc., but does have a time series for Monongahela Power Co.

**Figure 14**



Source: WV Public Service Commission and United States Bureau of Labor Statistics

The graph shows that electricity rates steadily decreased in real terms through 2006 and remained fairly constant with adjustment. Both adjusted and unadjusted prices have increased since 2006. Many possible factors contributed to this rise, including the increased costs of energy and the increased demand. A slight decrease at the start of 2013 may indicate that costs are falling slightly for power companies, and that savings is being passed to the consumer. Map 12 also shows the distribution of power lines, plants, and substations within West Virginia and Upshur County.

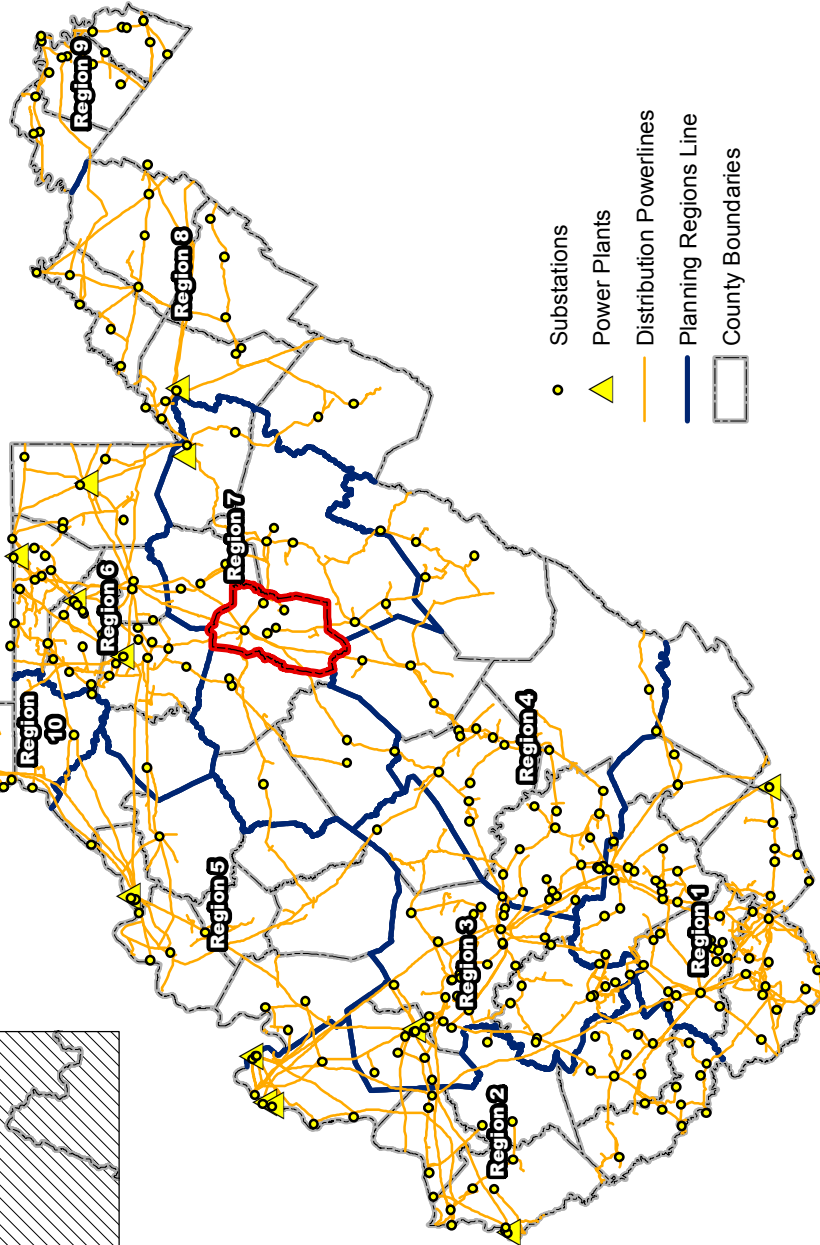
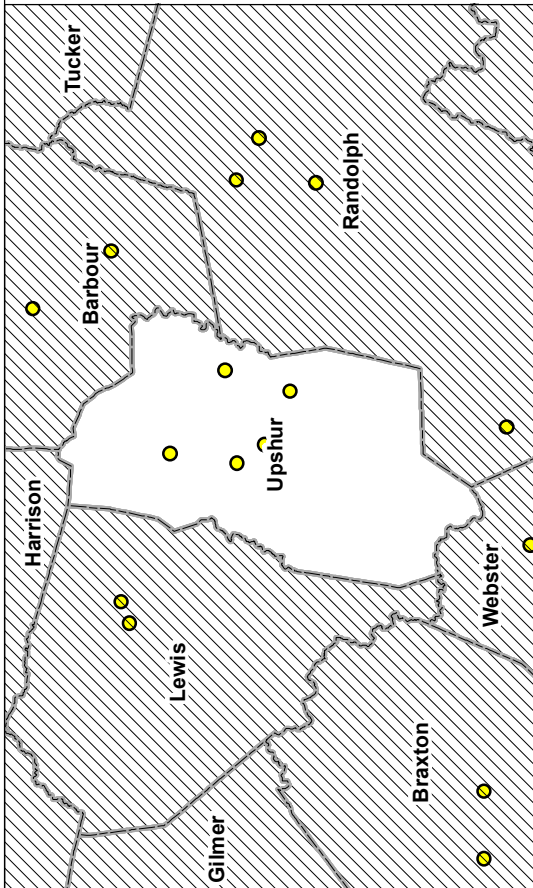
The two other utilities of particular importance are water and sewer. Table 1 displays water and sewer metered rates for the providers of those services. They are all public services with varying rates and categories. Upshur County has 11 public sewer and water providers. Maps 13 and 14 show the water and sewer facilities and the served areas for each of these utilities, as well as the solid waste management facilities in West Virginia, including the one in Upshur.

**Table 1: Upshur County Water and Sewer Rates**

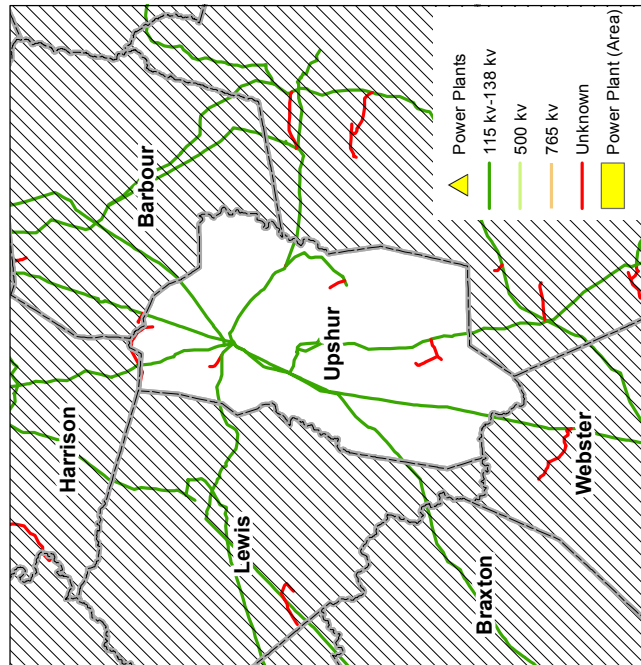
<b>Elkins Road Public Service District</b>	
<b>Water Rates</b>	
First 3000 gallons used per month	9.23 per 1000 gallons
Next 4000 gallons used per month	8.51 per 1000 gallons
Next 5000 gallons used per month	6.34 per 1000 gallons
All Over 12000 gallons used per month	5.15 per 1000 gallons
<b>Hodgesville Public Service District</b>	
<b>Water Rates</b>	
First 2000 gallons used per month	9.48 per 1000 gallons
Next 8000 gallons used per month	8.17 per 1000 gallons
All Over 10000 gallons used per month	6.93 per 1000 gallons
<b>Adrian Public Service District</b>	
<b>Water Rates</b>	
First 3000 gallons used per month	10.53 per 1000 gallons
Next 3000 gallons used per month	10.10 per 1000 gallons
Next 4000 gallons used per month	9.76 per 1000 gallons
Next 10000 gallons used per month	9.41 per 1000 gallons
All Over 20000 gallons used per month	9.06 per 1000 gallons
<b>Tennerton Public Service District</b>	
<b>Sewer Rates</b>	
All amounts used per month	7.76 per 1000 gallons
<b>Buckhannon</b>	
<b>Water Rates (Buckhannon Municipal Water Department)</b>	
First 2000 gallons used per month	4.78 per 1000 gallons
Next 12000 gallons used per month	4.60 per 1000 gallons
Next 36000 gallons used per month	4.13 per 1000 gallons
All Over 50000 gallons used per month	1.90 per 1000 gallons
<b>Sewer Rates (Buckhannon Sanitary Board)</b>	
First 2000 gallons used per month	8.30 per 1000 gallons
Next 12000 gallons used per month	6.95 per 1000 gallons
Next 36000 gallons used per month	6.55 per 1000 gallons
Next 150000 gallons used per month	5.65 per 1000 gallons
All Over 200000 gallons used per month	4.70 per 1000 gallons

# Utilities - Electricity

Upshur County



- Substations
- ▲ Power Plants
- Distribution Powerlines
- Planning Regions Line
- County Boundaries



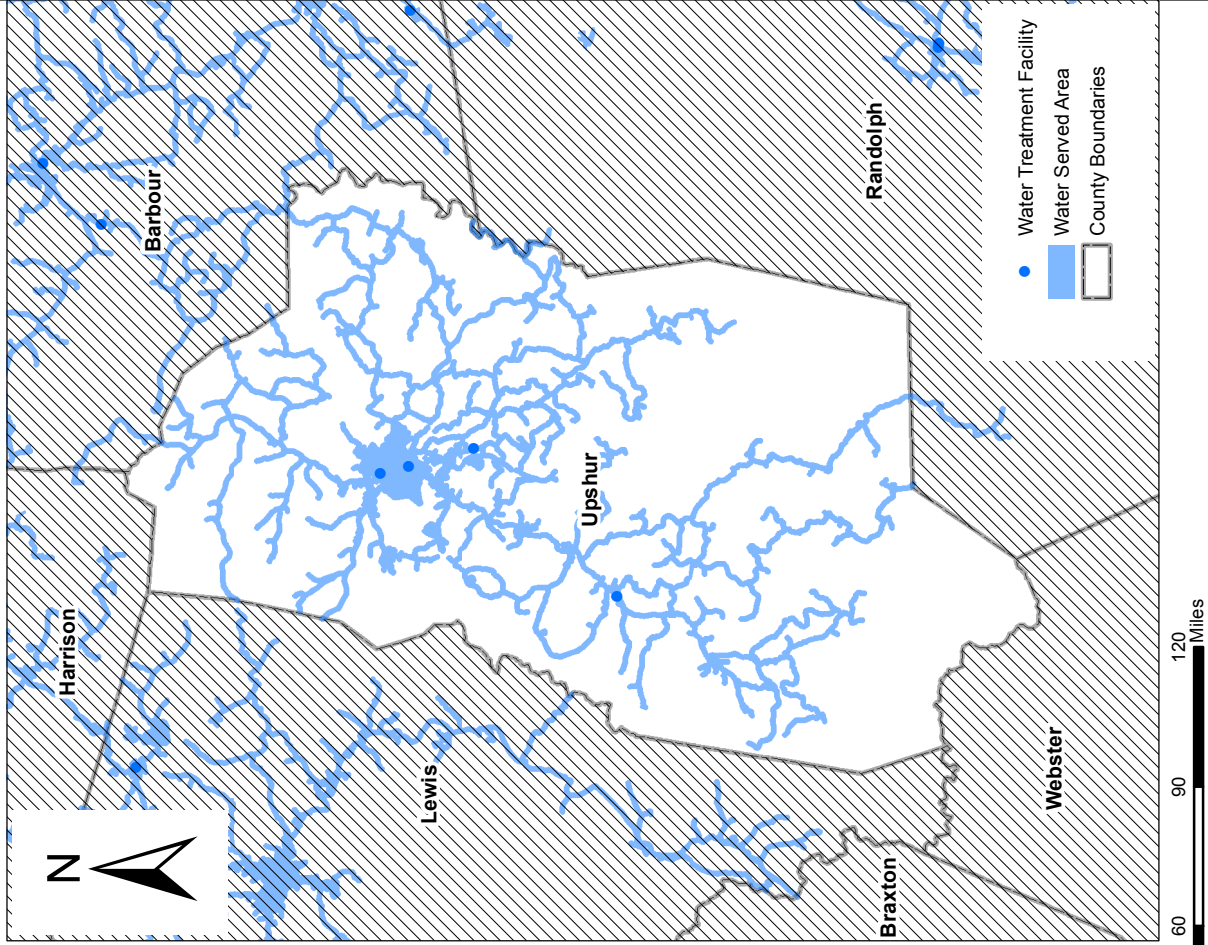
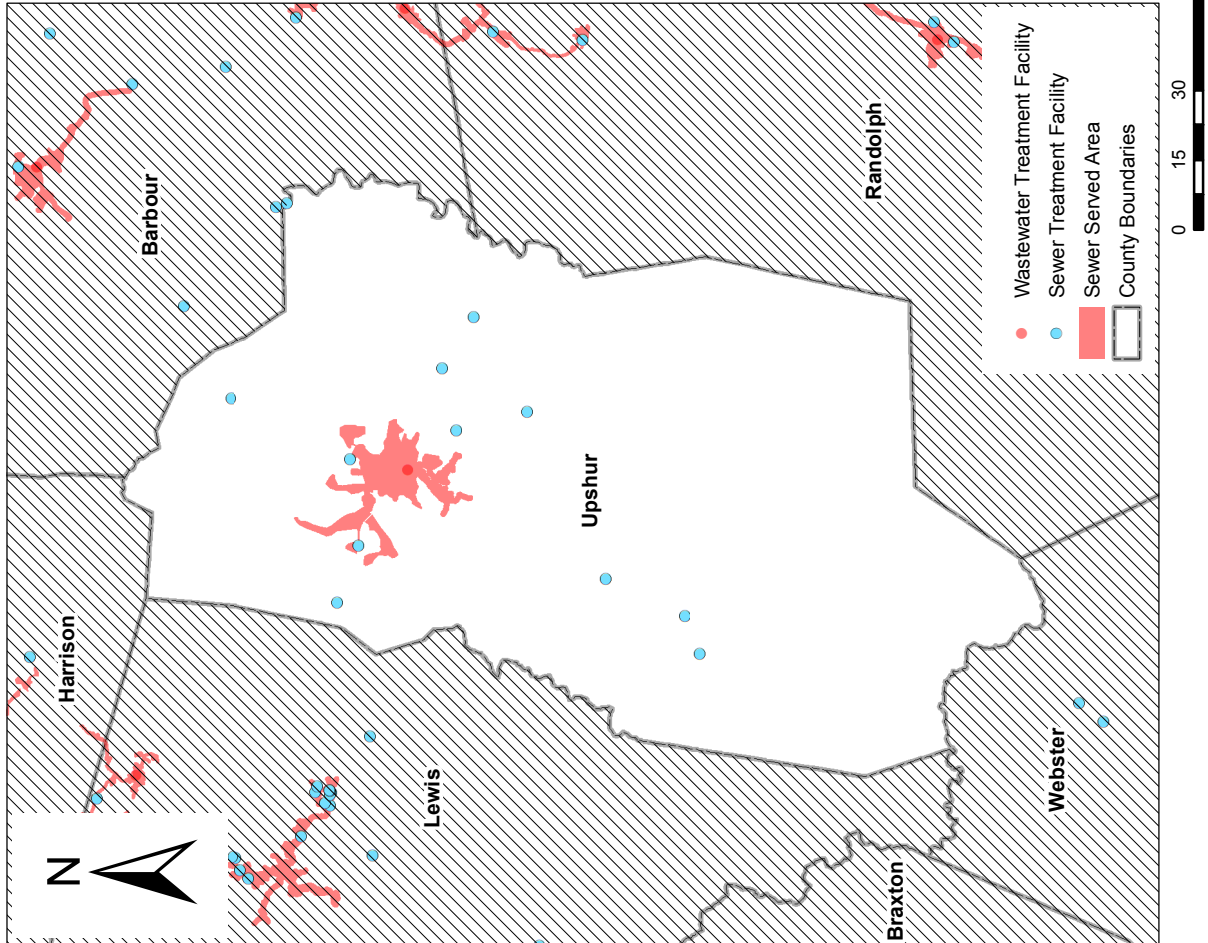
Source: West Virginia Division of Natural Resources, Statewide Addressing and Mapping 2008

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# Utilities - Water and Sewer

## Upshur County



Source: West Virginia Infrastructure and Jobs Development Council N.A.

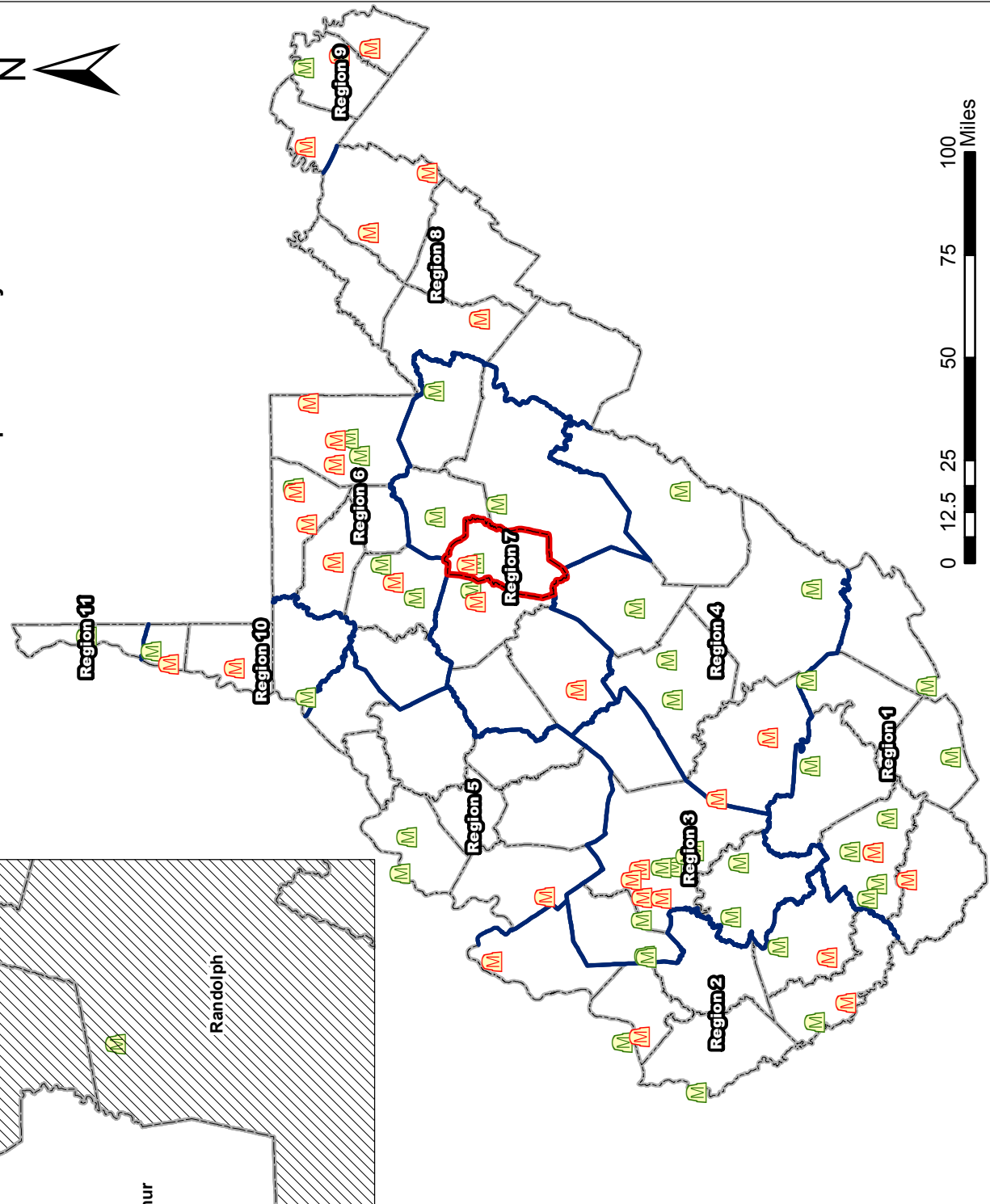
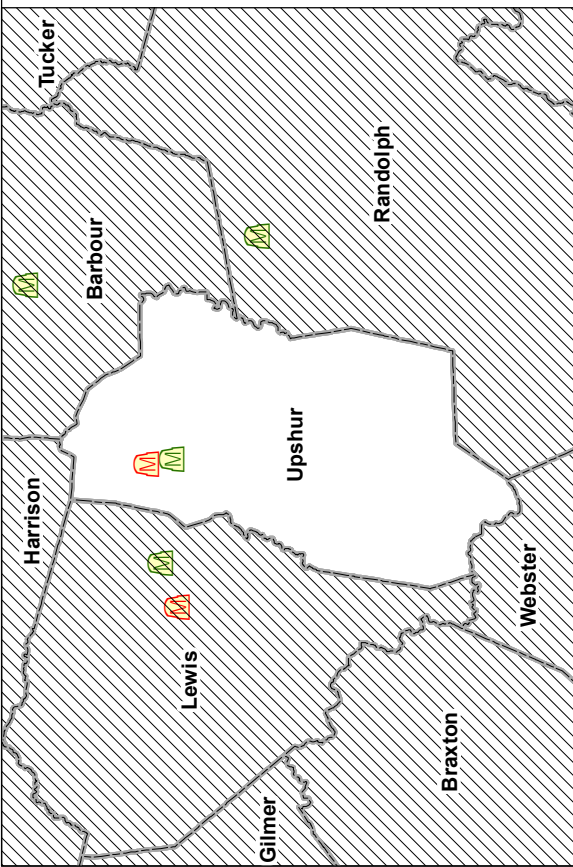
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# Utility - Solid Waste Facility

Upshur County



-  Closed
-  Operating
-  Planning Regions Line
-  County Boundaries

Source: West Virginia Department of Environmental Protection 2002

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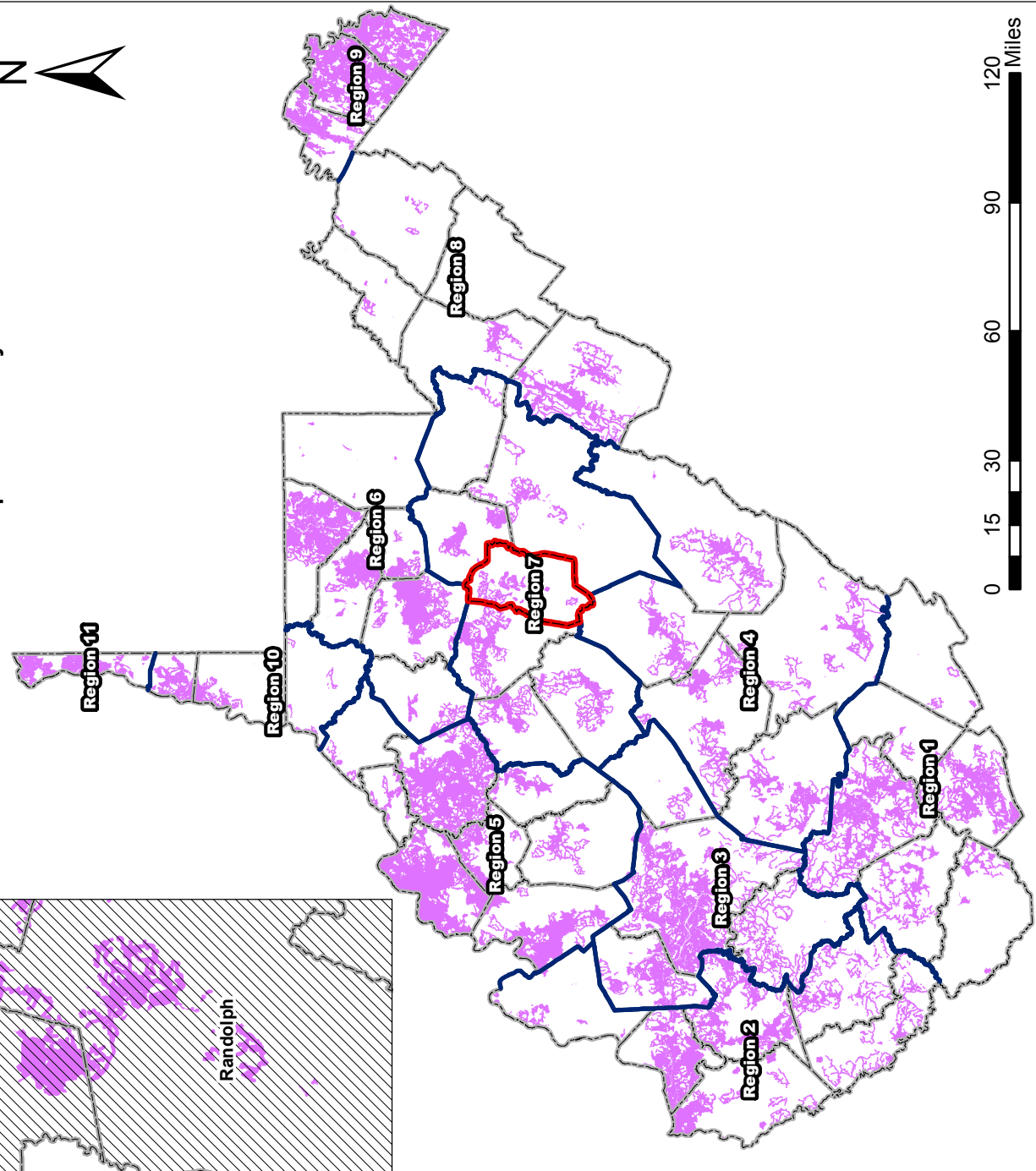
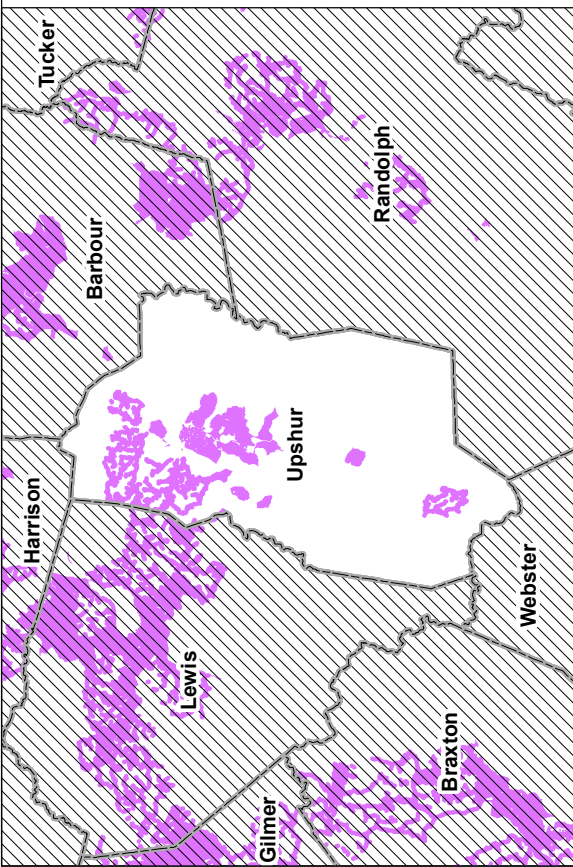
One essential modern convenience, now widely understood as an essential utility in a globalized world, is broadband access. The following 11 maps demonstrate Upshur County's broadband infrastructure in relation to the State's. The largest number of providers in Upshur County is 4 in Buckhannon. Upshur County broadband infrastructure appears to be a mix of rural and urban counties. Unlike other counties, Upshur contains fixed wireless, the connection of two fixed points wirelessly by radio or other links, but broadband coverage appears to be spotty, though not as underdeveloped as nearby counties. Though the lack of broadband is extensive, it actually ranks well compared to other coalfield counties.




Map 15 shows physical cable infrastructure running from ISPs to other structures. DSL, BPL, and other copper represent the transferal system of broadband (Map 16). Map 17 shows the entire wire system, represented by physical wires, while Maps 18 and 19 show the maximum uploading and downloading speeds for the system. Map 20 shows the total number of providers, which is denser in the more economically developed areas of the State. Map 21 has fixed wireless coverage, or the connection between two fixed points wirelessly by radio or other links, and the next two maps show the maximum uploading and downloading speeds in a given area (22 and 23). Map 24 shows the location of mobile wireless coverage, including for smartphones and tablets, and Map 25 shows areas where no broadband coverage is reported in any way.

Each of these maps shows the same pattern in Upshur County internet service as exhibited by WV. Internet service, specifically broadband, is non-existent in many rural areas, and instead focuses on population centers. While this may be financially wise, it deprives rural areas of an increasingly integral link to a globalized economy and society. All areas now need broadband service, and a complete inventory of these services is needed to plan for future investment in any given area.

# Broadband - Internet Cable and FTTP Coverage

Upshur County



-  Planning Regions Line
-  Cable and FTTP
-  County Boundaries



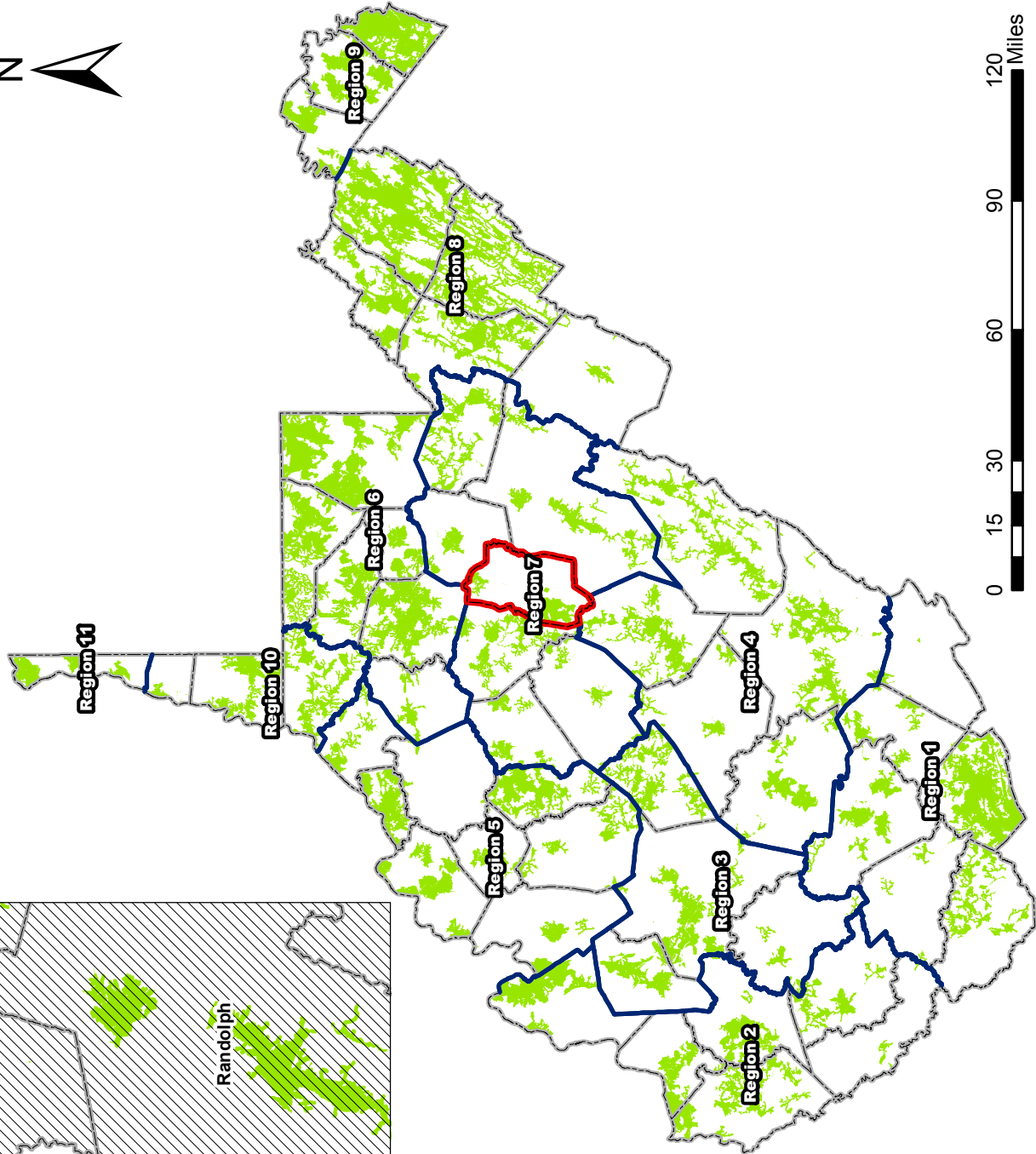
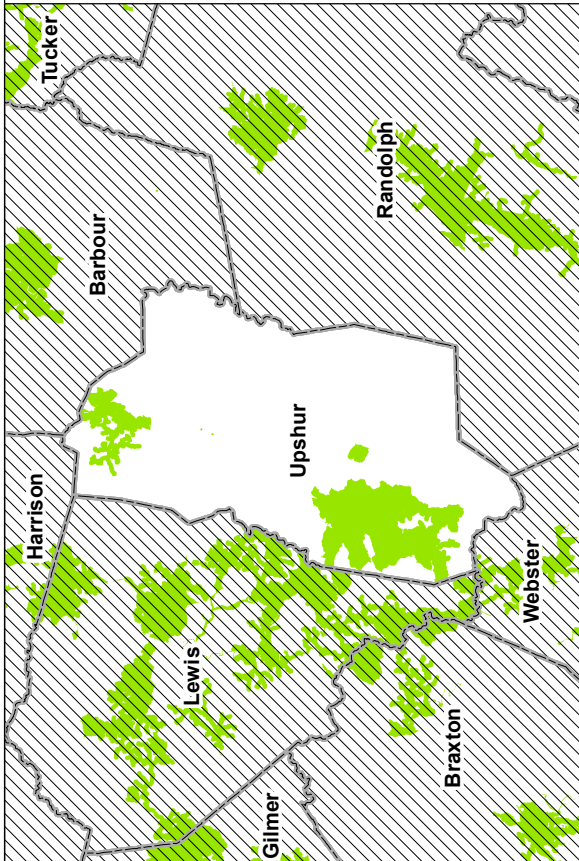
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - Internet DSL, BPL, Other Copper

## Upshur County



-  Planning Regions Line
-  DSL, BPL, Other Copper
-  County Boundaries

Source: West Virginia Broadband Mapping Program 2012

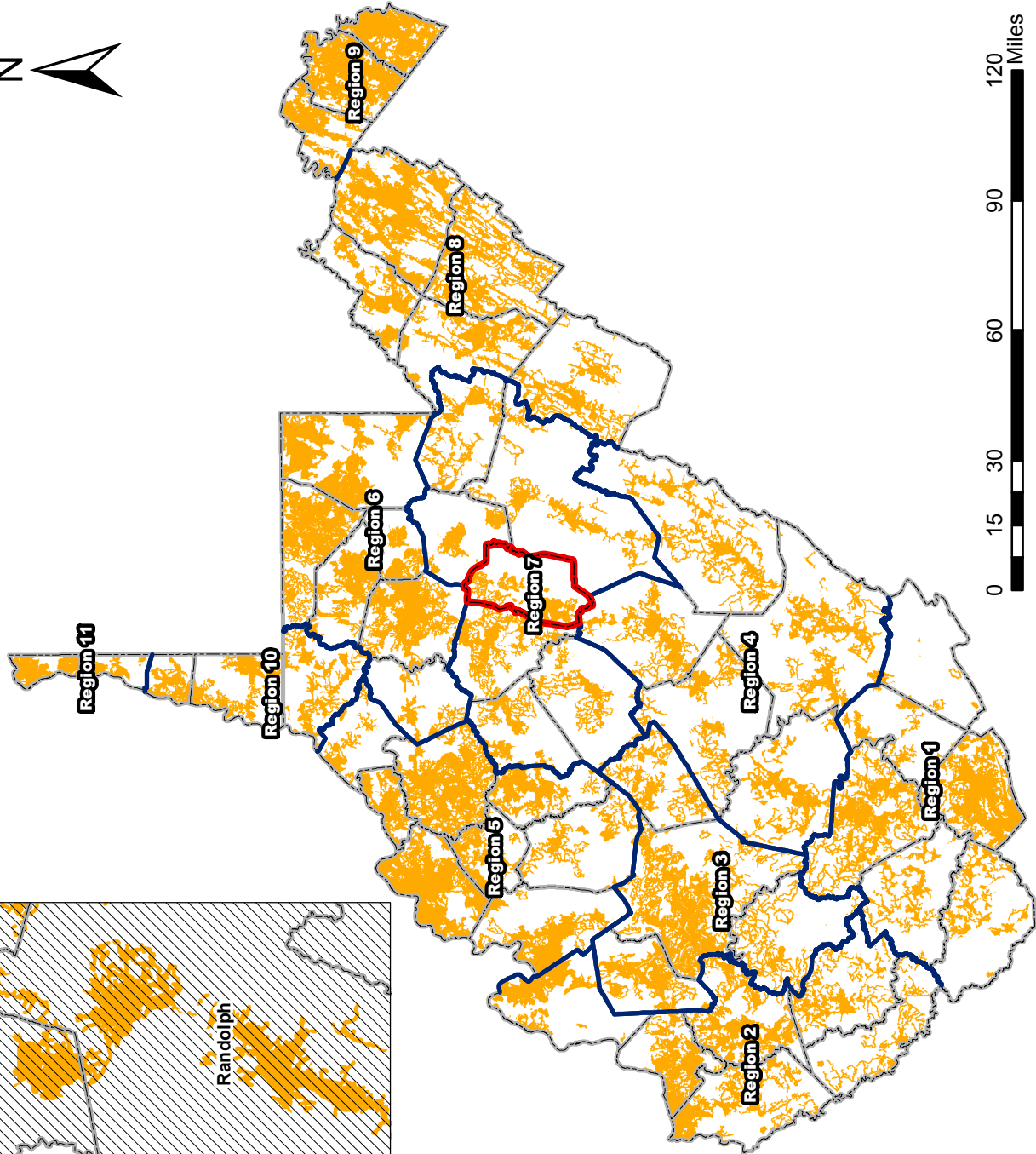
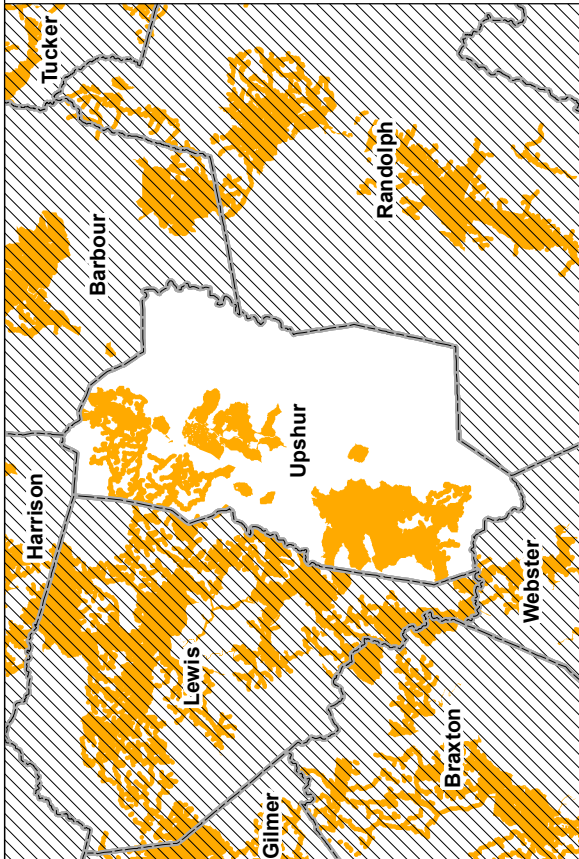
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# Broadband - Internet Wireline Coverage

Upshur County



- Planning Regions Line
- Wireline Coverage
- County Boundaries

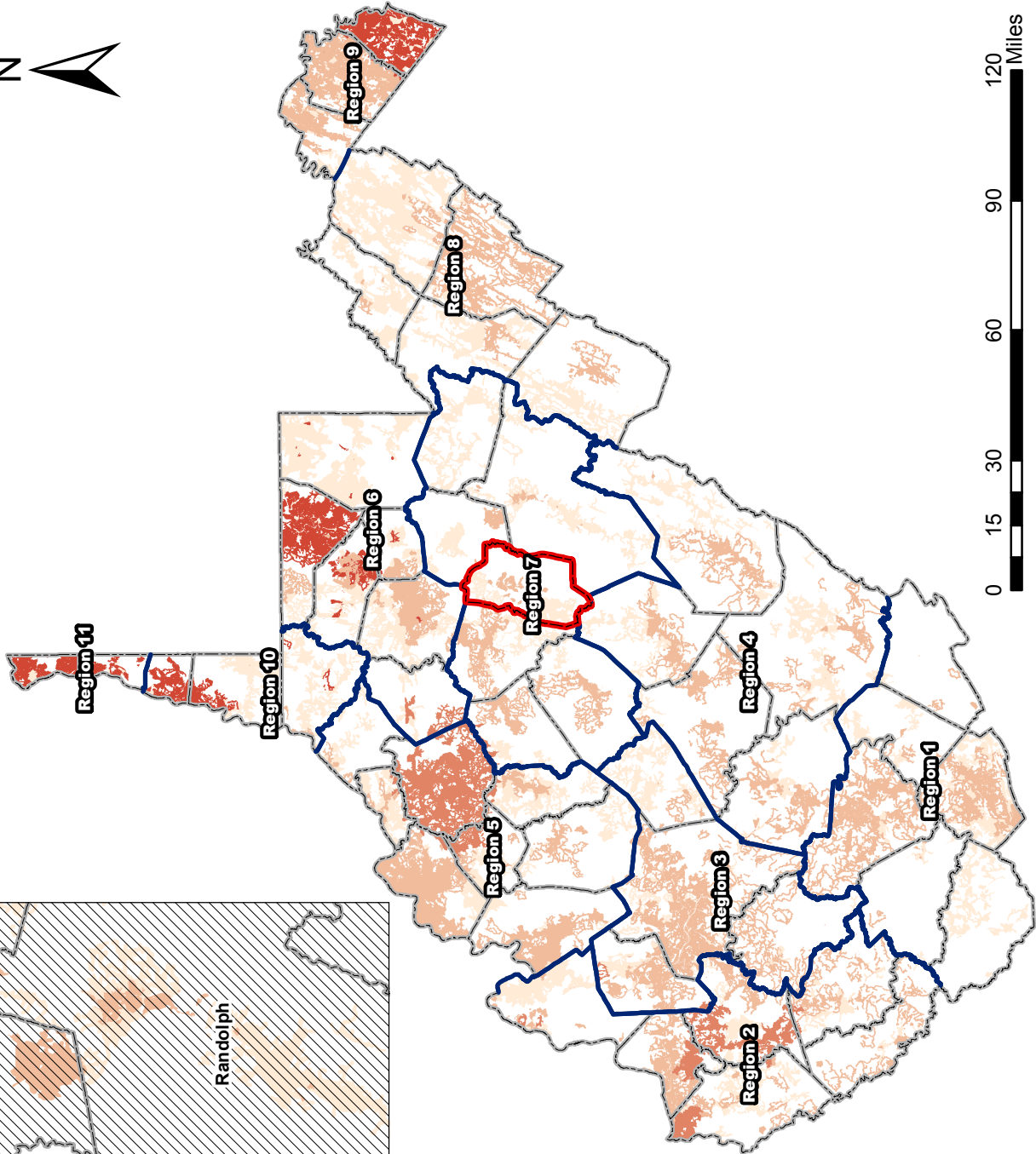
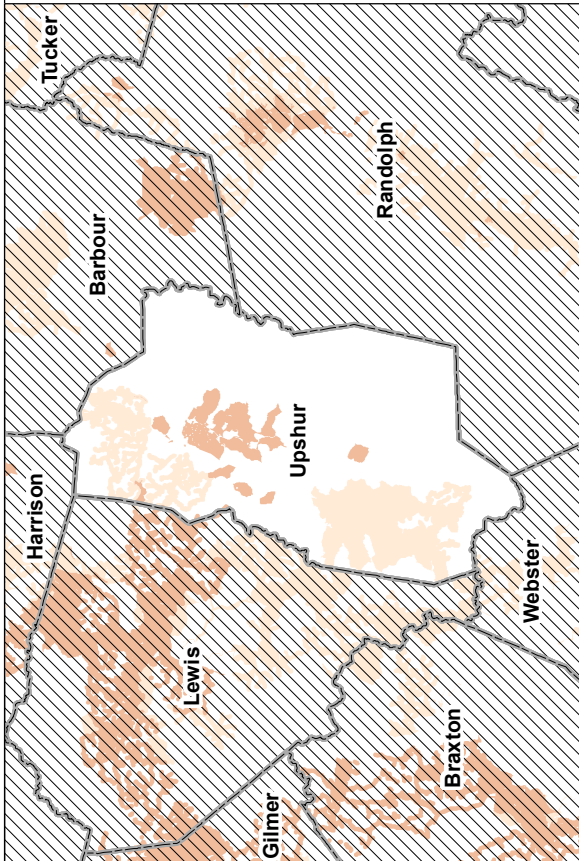
Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet MaxUp Speed Wireline

Upshur County



- Planning Regions Line
- 200 - 768 kbps
- 768 kbps - 3 mbps
- 3 - 10 mbps
- 10 - 25 mbps
- Greater than 25 mbps
- County Boundaries

Source: West Virginia Broadband Mapping Program 2012

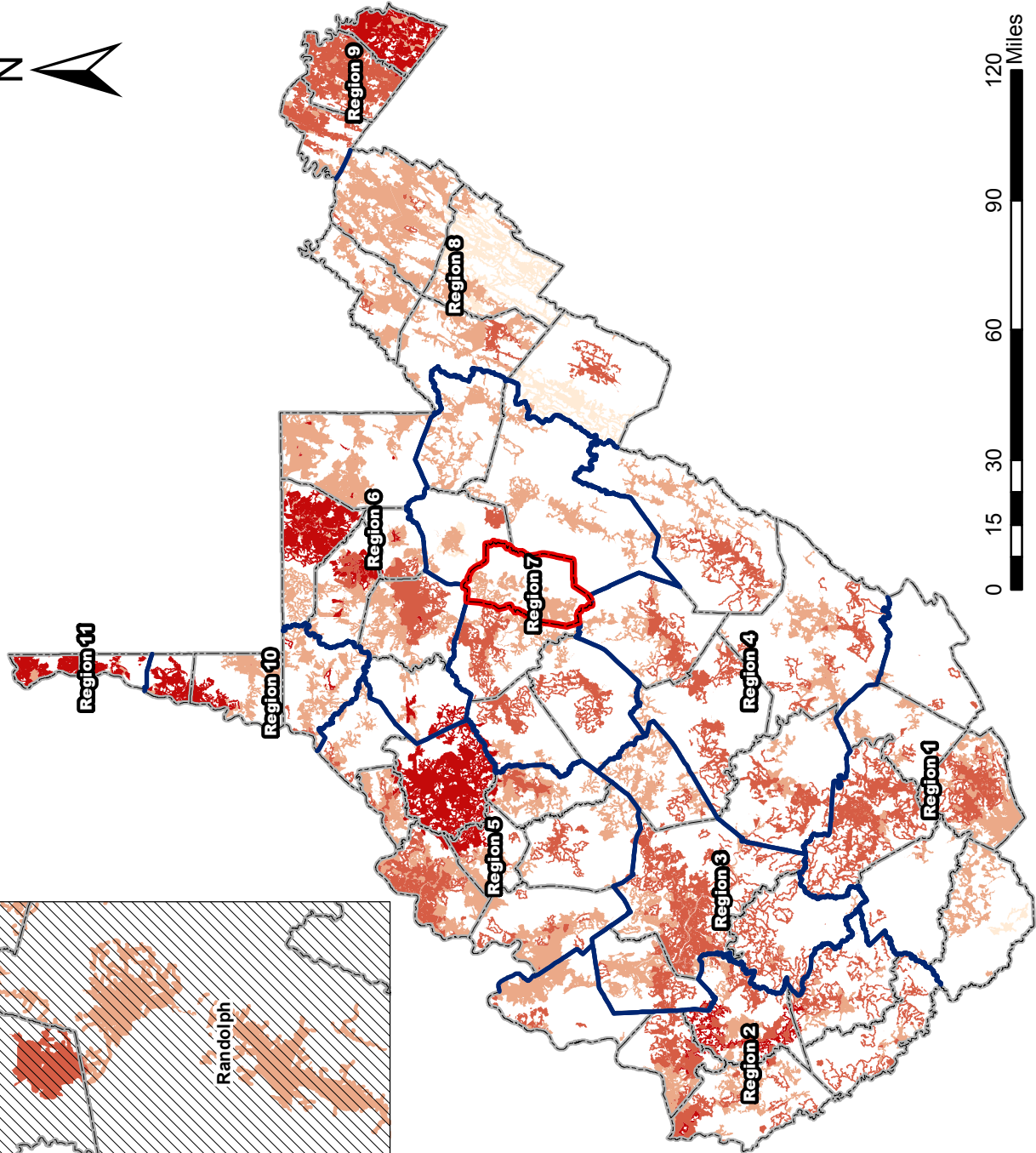
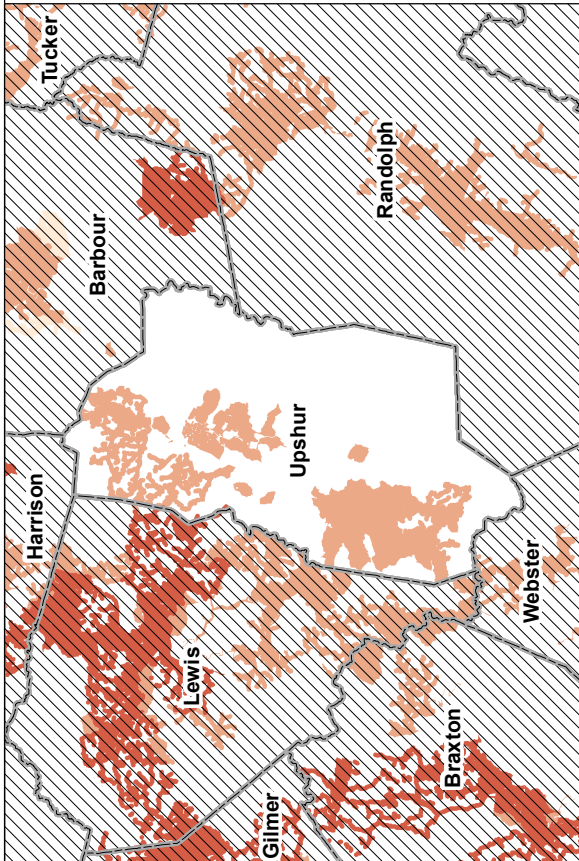
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# Broadband - Internet MaxDown Speed Wireline

Upshur County



-  Planning Regions Line
-  768 kbps - 3 mbps
-  3 - 10 mbps
-  10 - 25 mbps
-  Greater than 25 mbps
-  County Boundaries



Source: West Virginia Broadband Mapping Program 2012

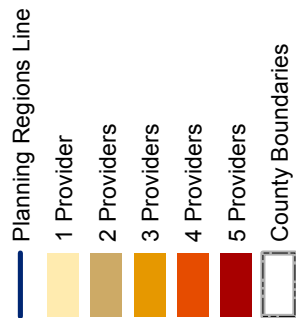
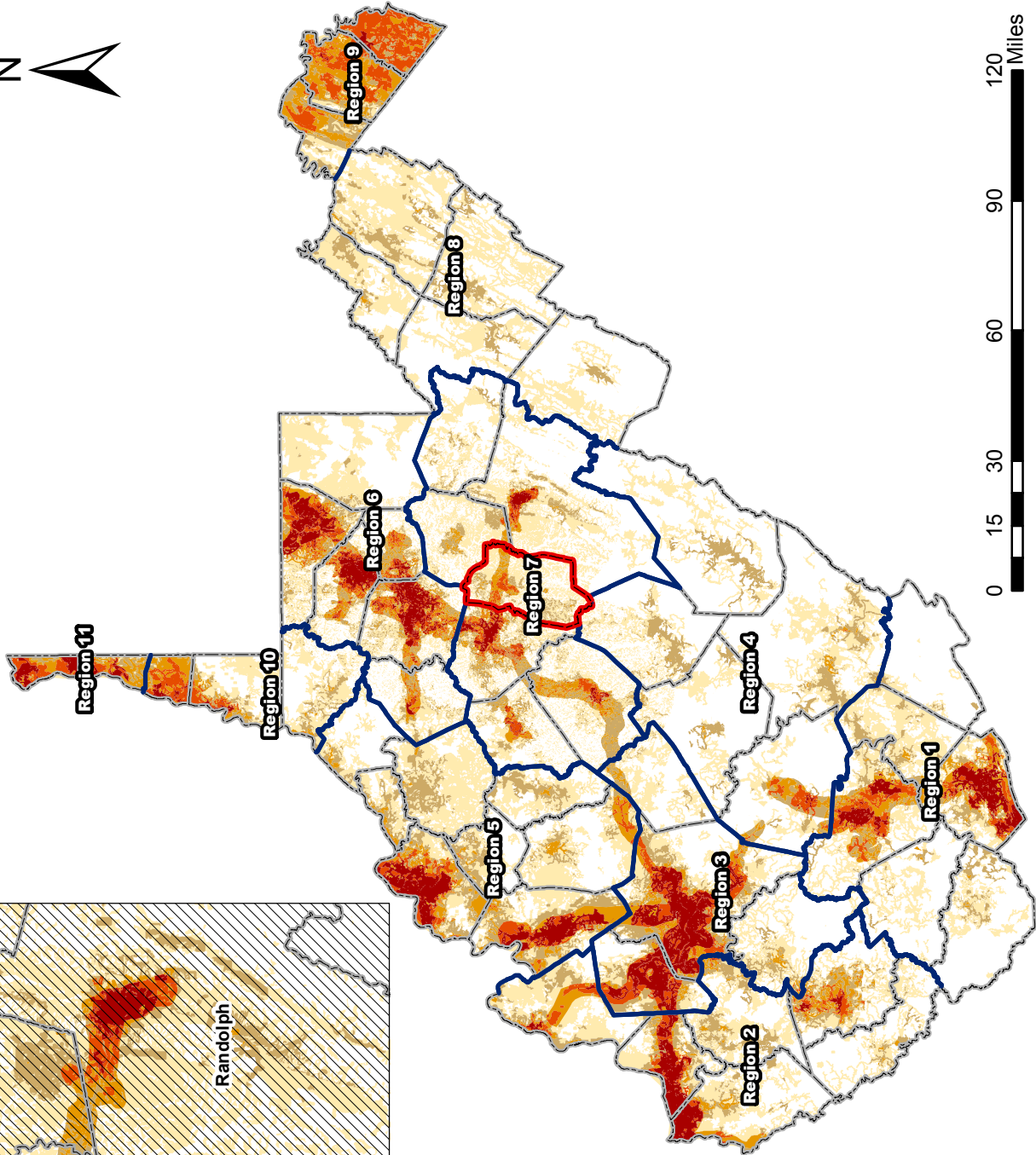
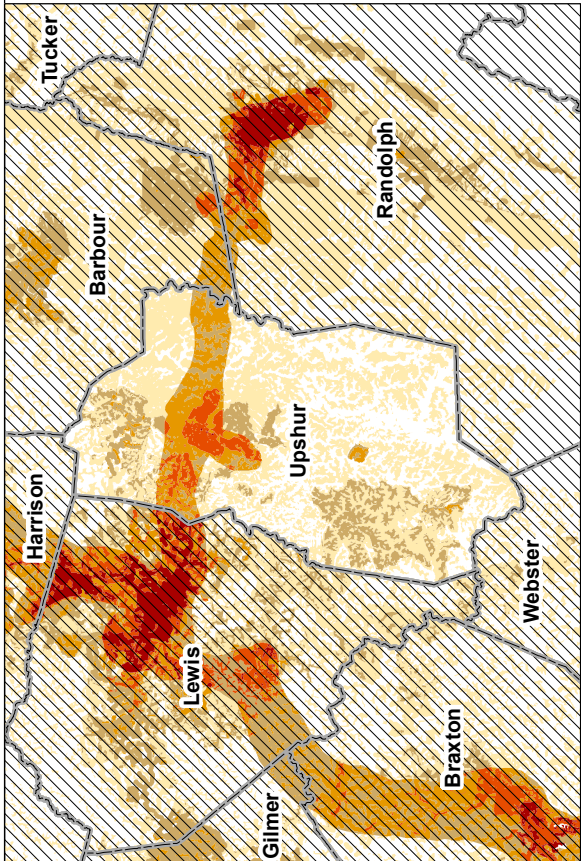
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# Broadband - Internet Total Number of Providers

Upshur County

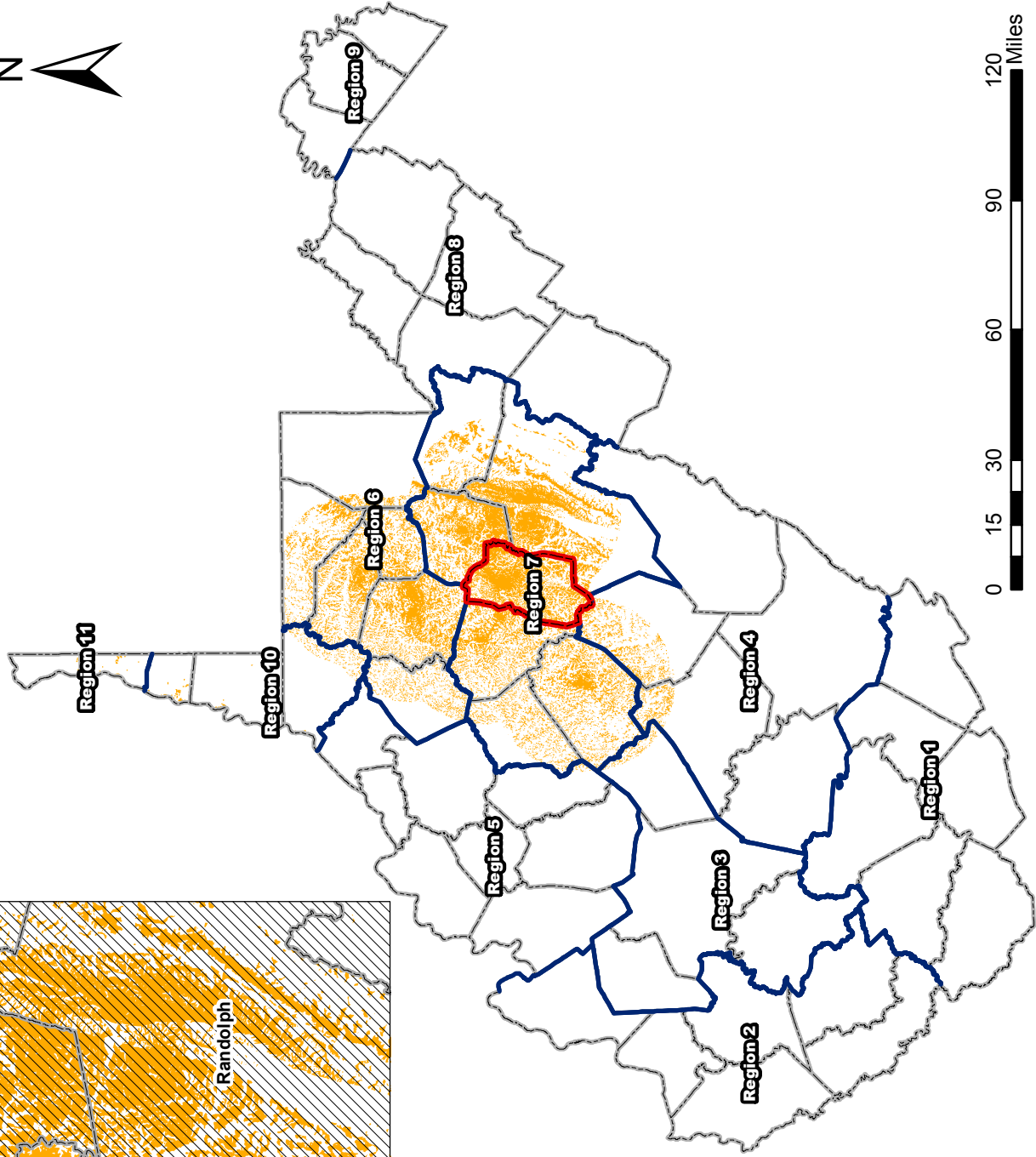
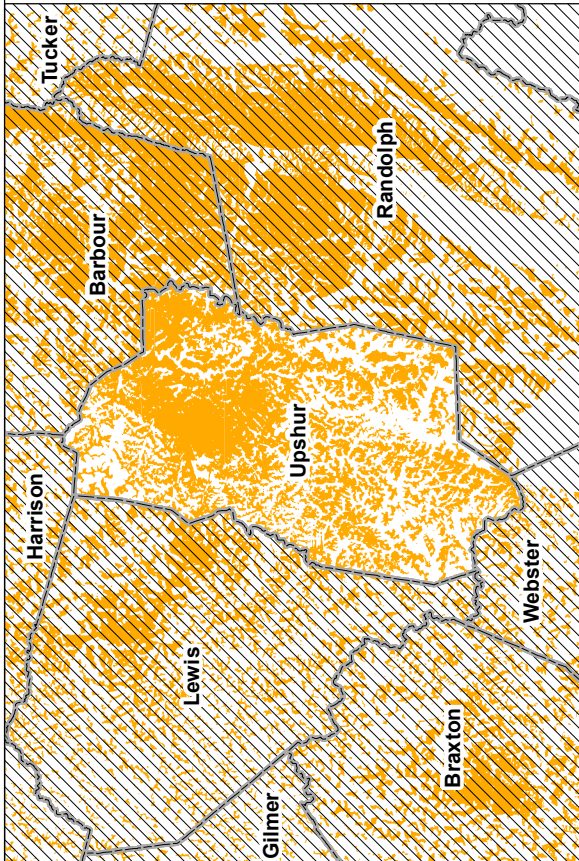


Source: West Virginia Broadband Mapping Program 2012

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# Broadband - Internet Fixed Wireless Coverage

Upshur County



- Planning Regions Line
- Fixed Wireless
- County Boundaries

Source: West Virginia Broadband Mapping Program 2012

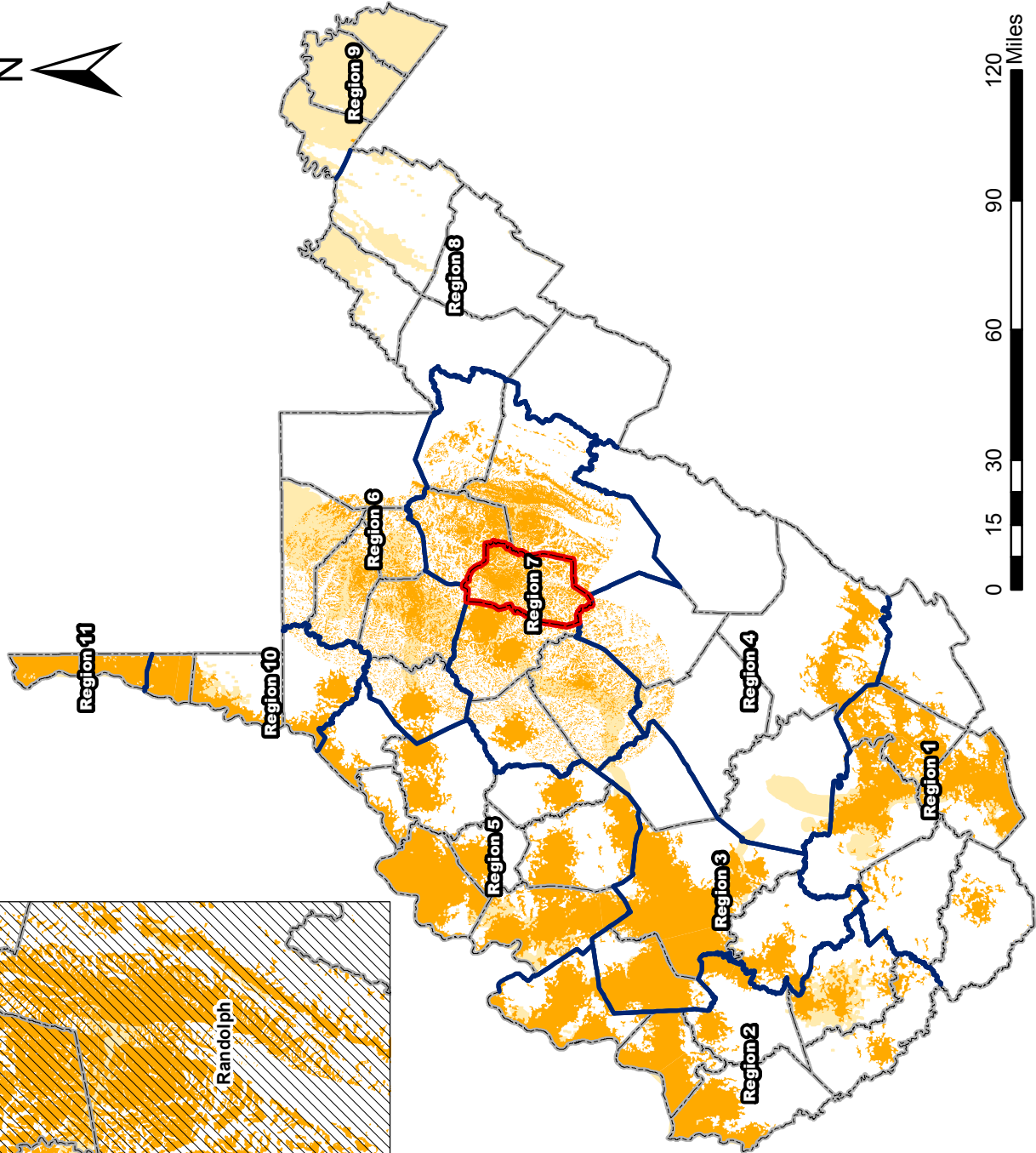
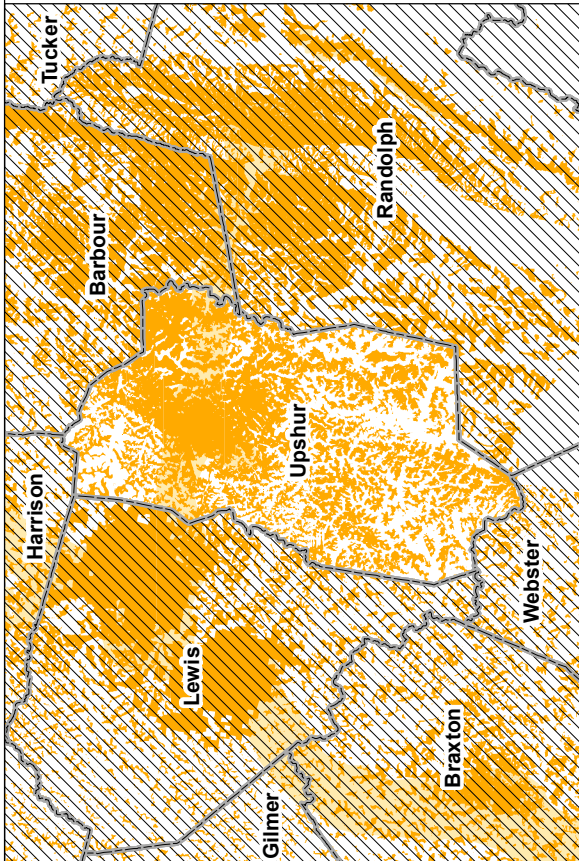
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# Broadband - Internet MaxDown Speed Wireless

Upshur County



-  Planning Regions Line
-  768 kbps - 3 mbps
-  3 - 10 mbps
-  County Boundaries

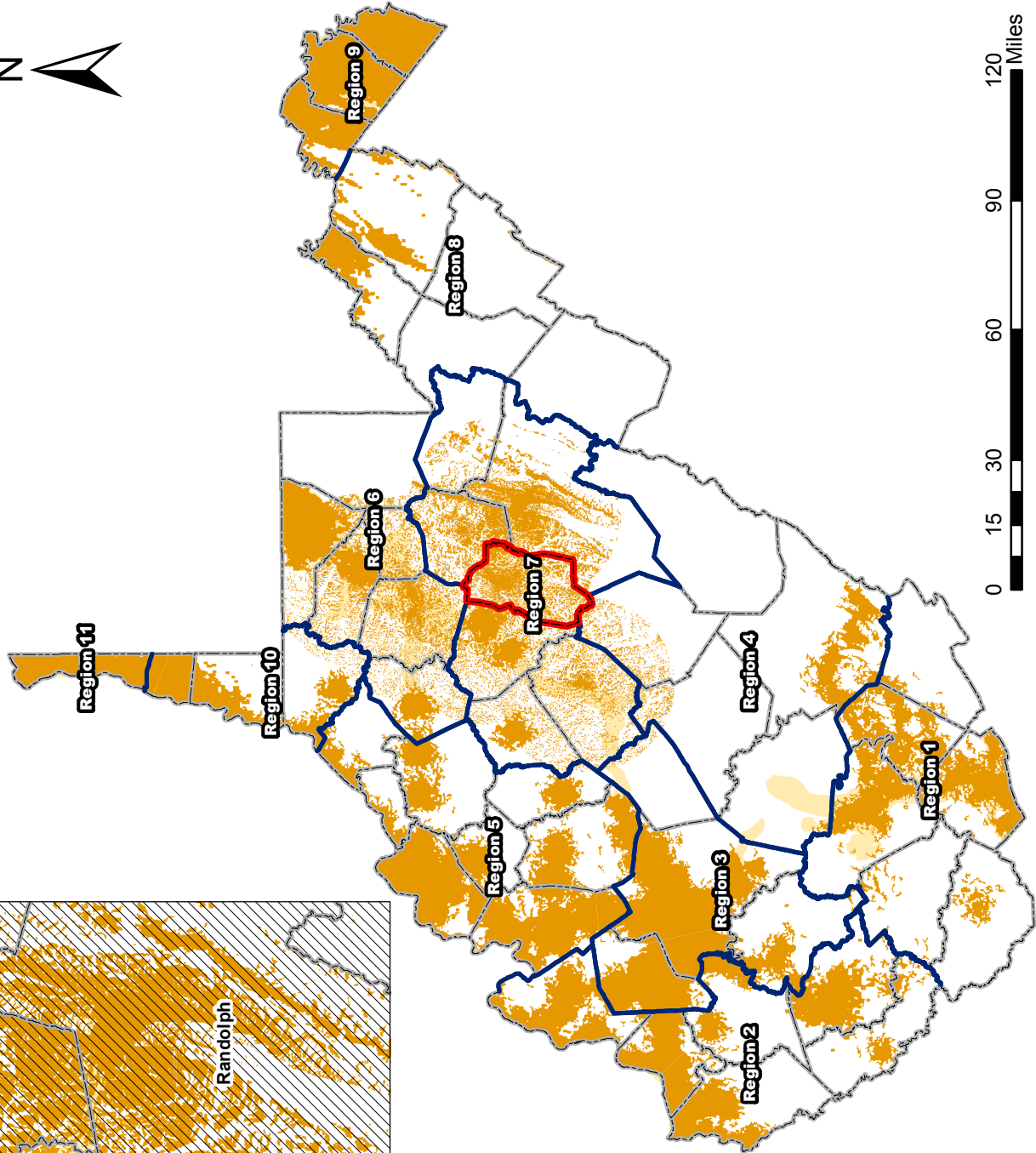
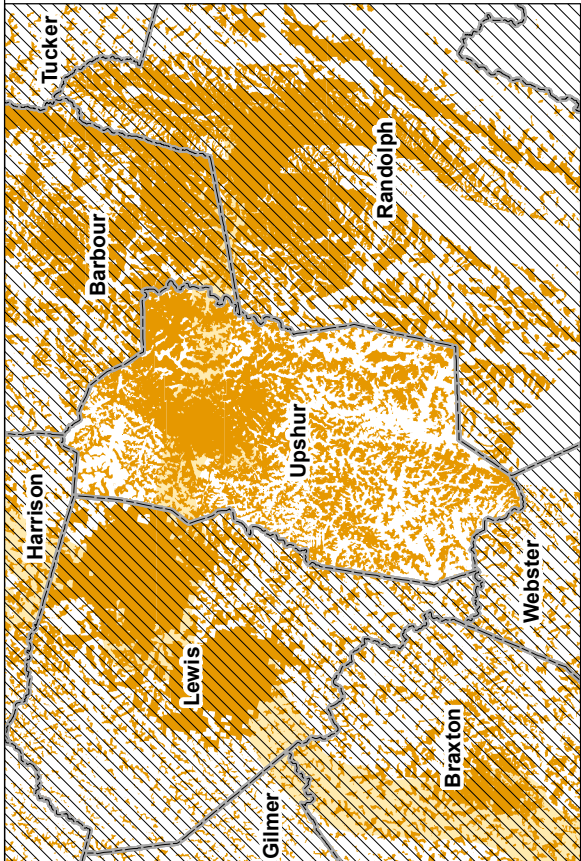
Source: West Virginia Broadband Mapping Program 2012





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# Broadband - Internet MaxUp Speed Wireless

## Upshur County



-  Planning Regions Line
-  200 - 768 kbps
-  768 kbps - 3 mbps
-  County Boundaries



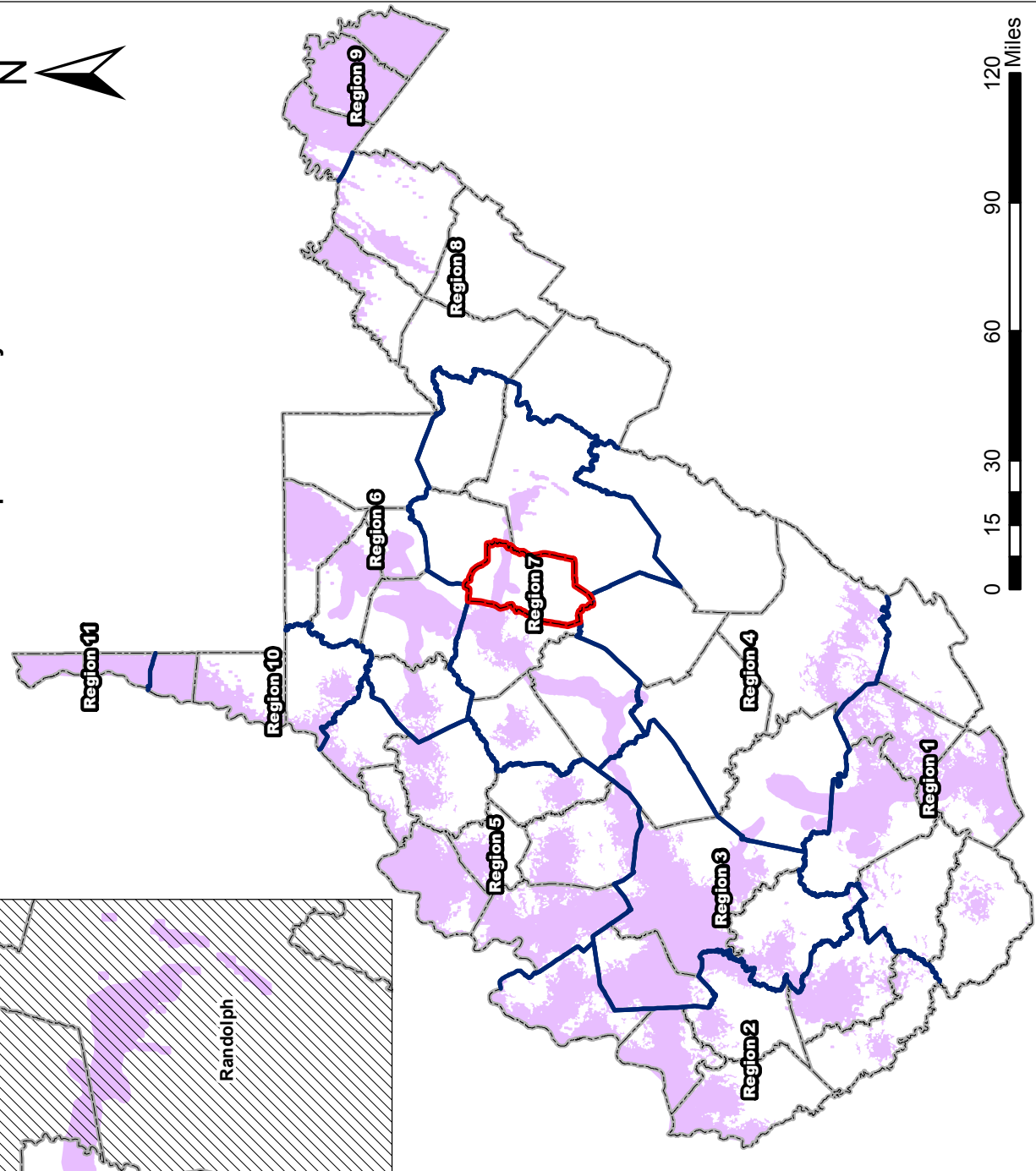
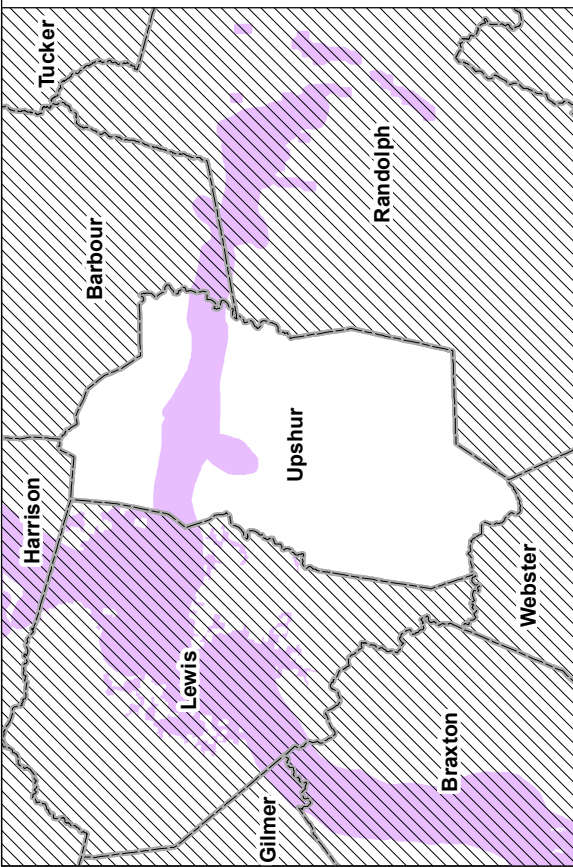
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - Internet Mobile Wireless Coverage

Upshur County



-  Planning Regions Line
-  Mobile Wireless
-  County Boundaries

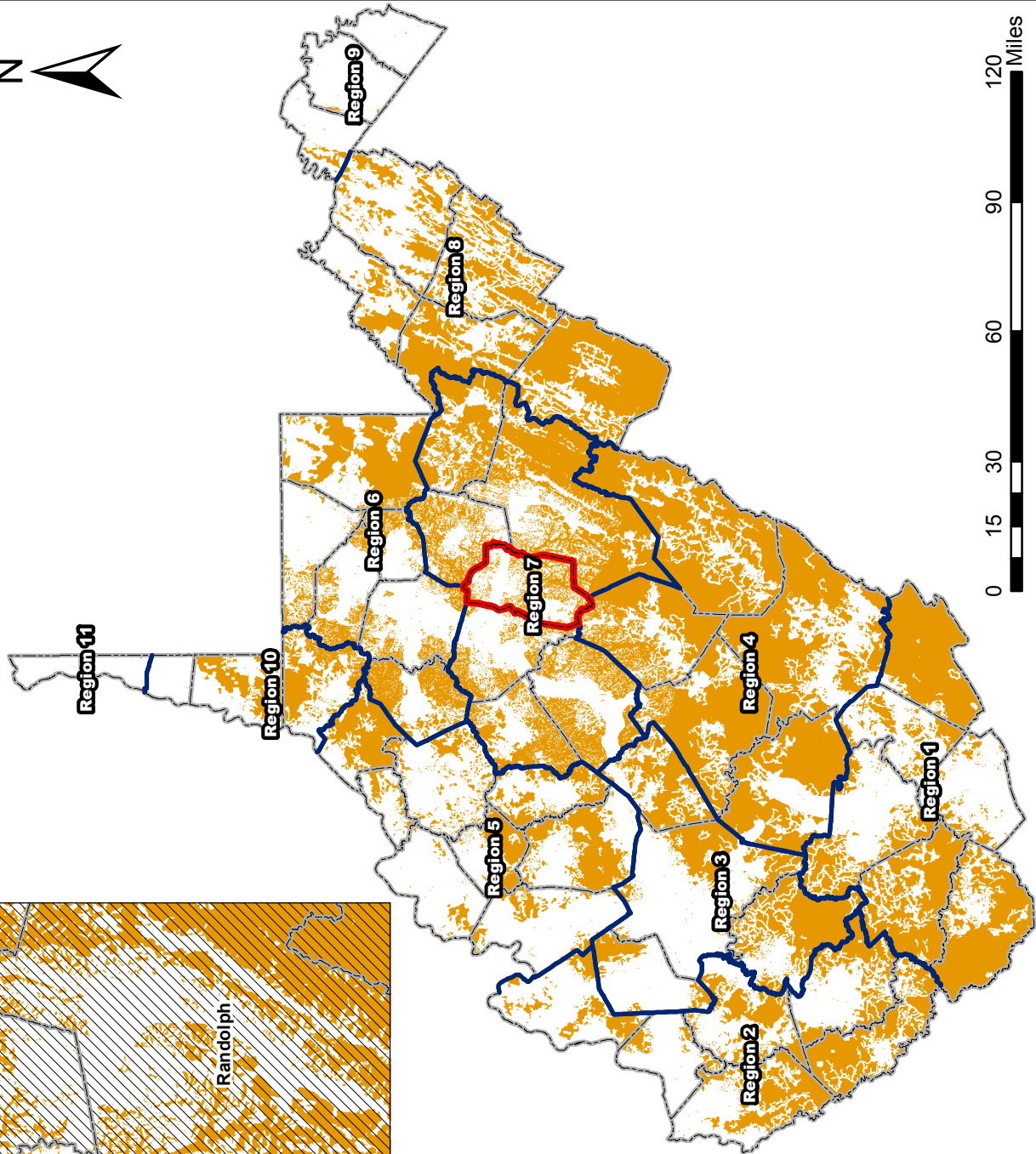
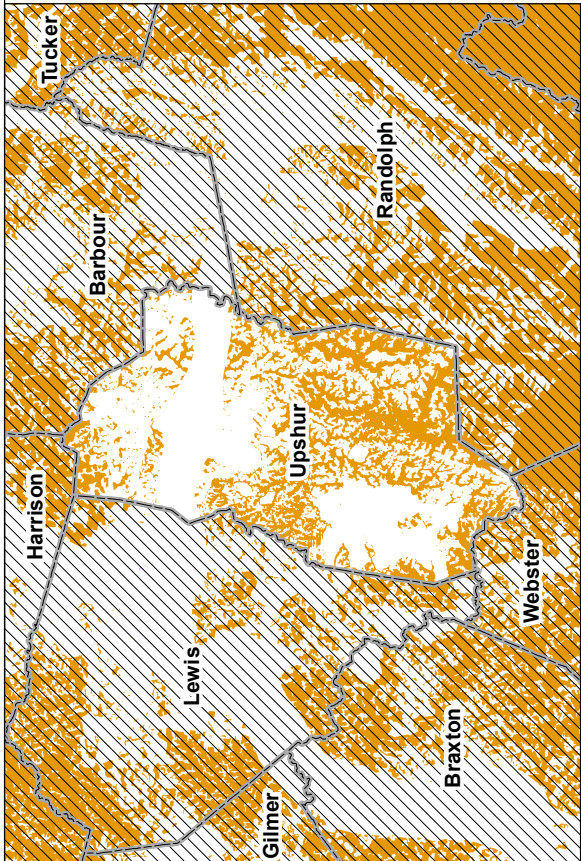
Source: West Virginia Broadband Mapping Program 2012




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# Broadband - No Broadband Coverage

Upshur County



-  Planning Regions Line
-  No Coverage Reported
-  County Boundaries



Source: West Virginia Broadband Mapping Program 2012

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## **Transportation**

### *Highways*

Upshur County is crisscrossed by US Routes 33 and 119 as well as State Routes 4 and 20 (Map 26).

### *Rail*

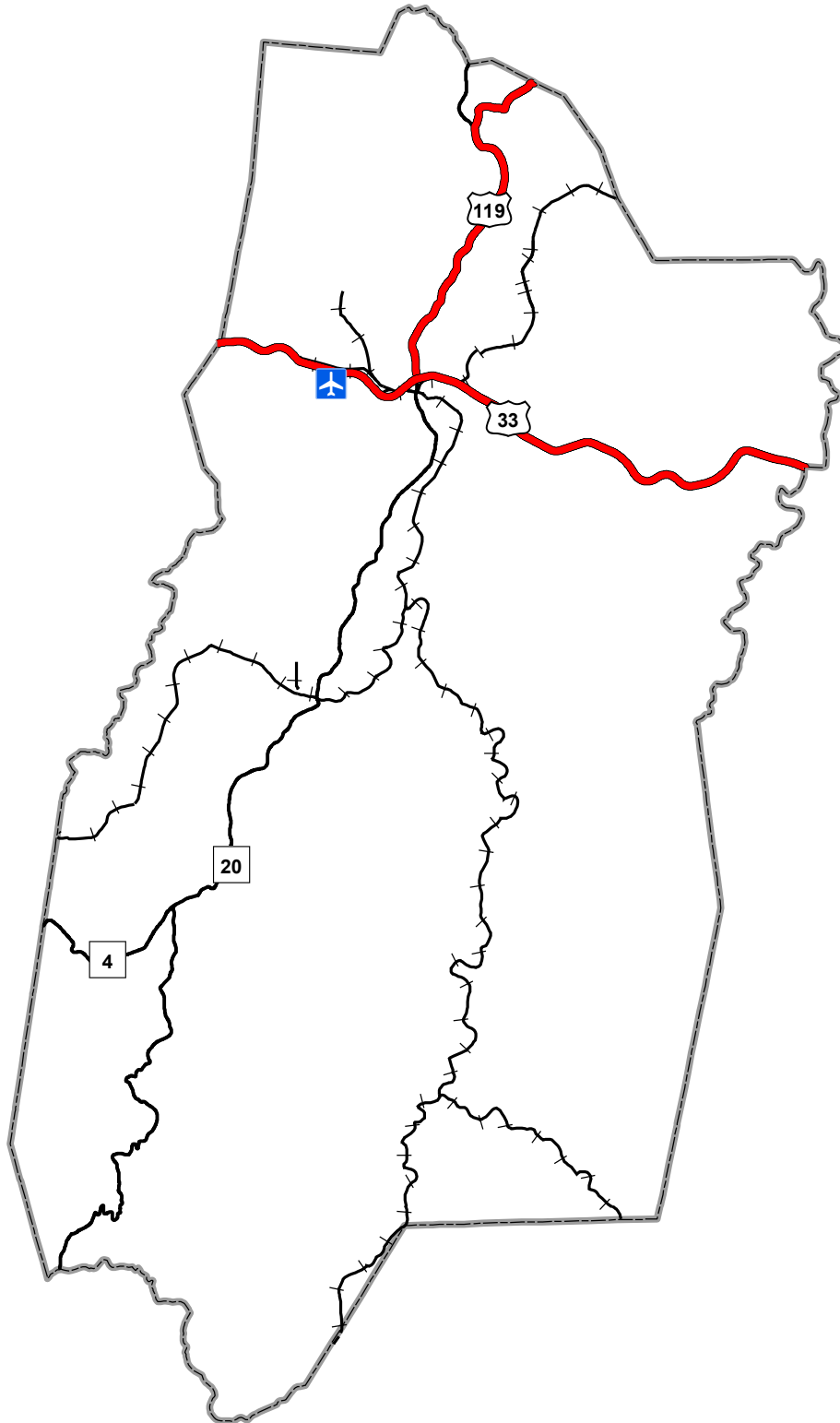
Several railroads own miles of track in Upshur County, and the rail infrastructure is extensive compared with other counties in the state.






### *Air*

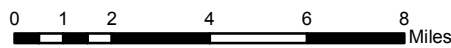
Upshur County Regional Airport operates in the county. It was activated in 1998 and operates 16 aircraft in the field.

# Transportation

## Upshur County



-  Airport
-  US Routes
-  WV Routes
-  Railroads
-  County Boundary



Source: Airports; United States Department of Transportation 2012, West Virginia GIS Technical Center; US Routes, West Virginia Routes, I66 Pikeville, King Coal Highway; West Virginia Department of Transportation 2012; Railroads; Rahall Transportation Institute 2012

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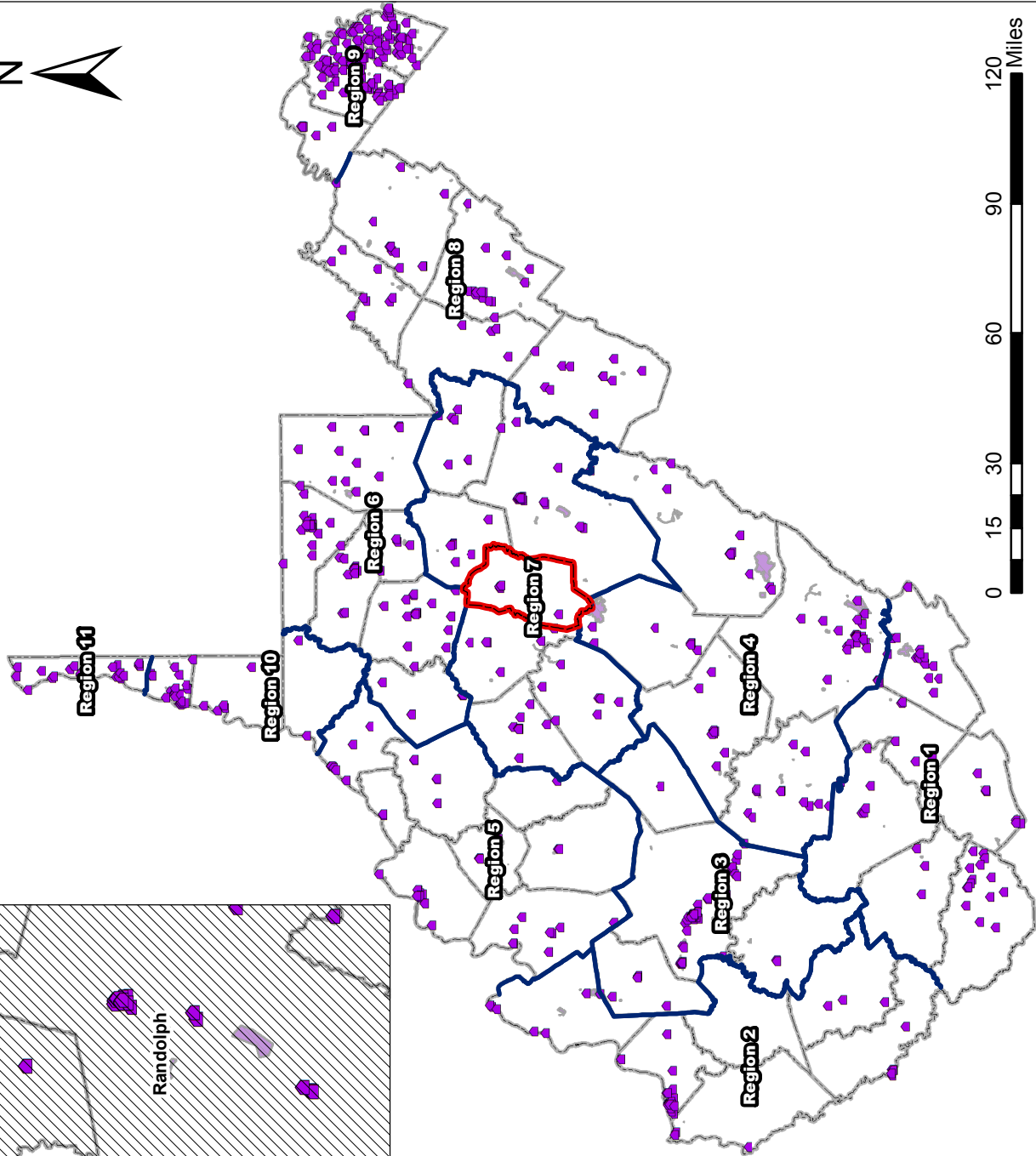
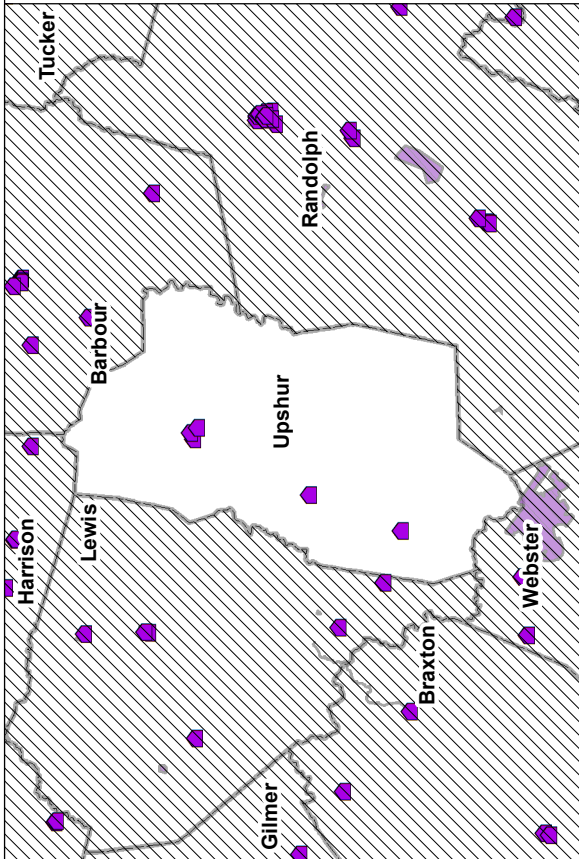






## **Historic Preservation**

Historic preservation will be essential in a county steeped in coal mining history. Upshur County has seven listings in the National Register of Historic Places including two historic districts, two churches, and part of West Virginia Wesleyan College (Map 27). However, other historic areas have been designated by West Virginia. Map 28 gives a spatial position to each designated State historic piece of architecture.

# National Register of Historic Place

## Upshur County



-  National Register of Historic Place
-  Planning Regions Line
-  National Register of Historic Place (Area)
-  County Boundaries

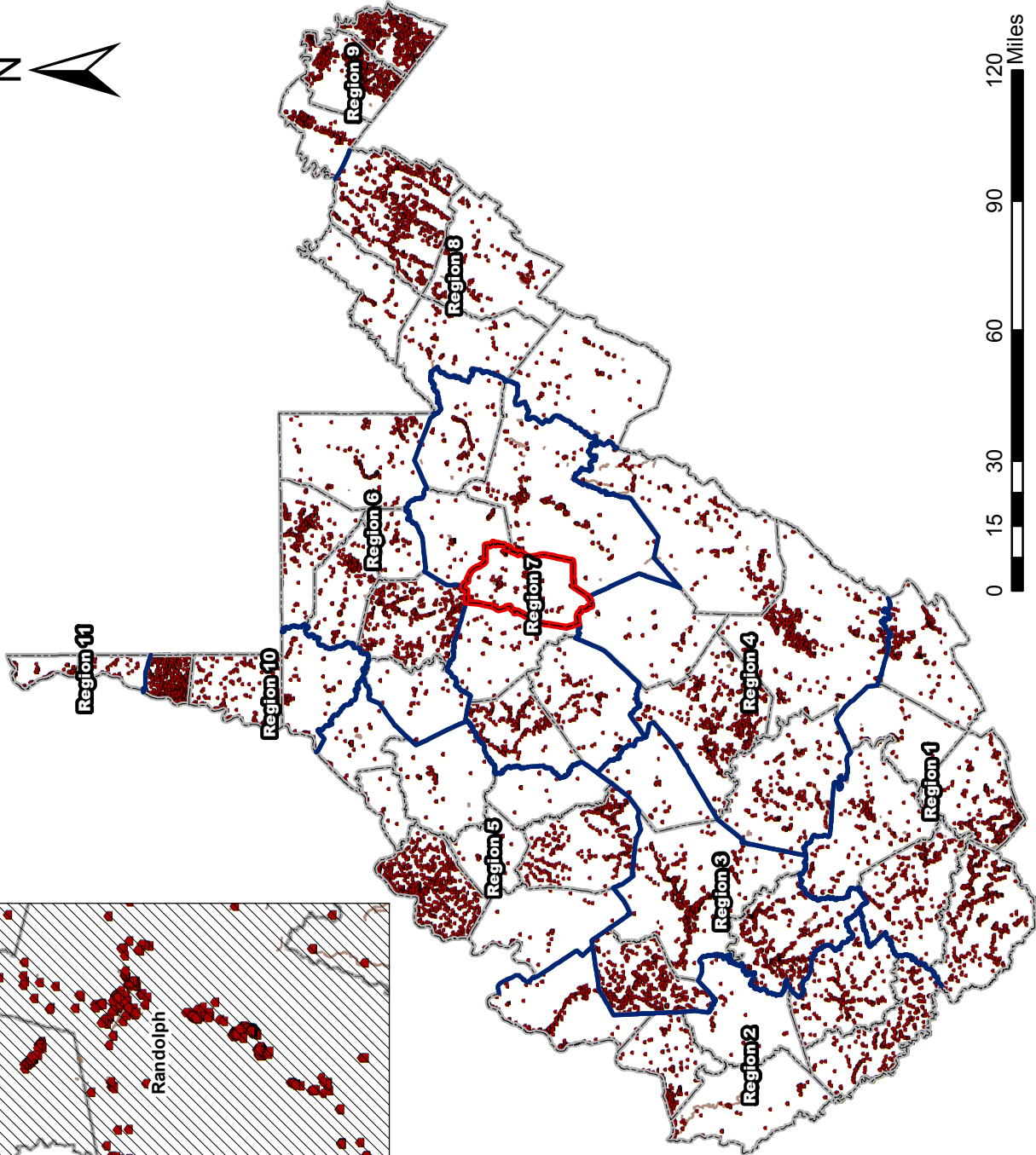
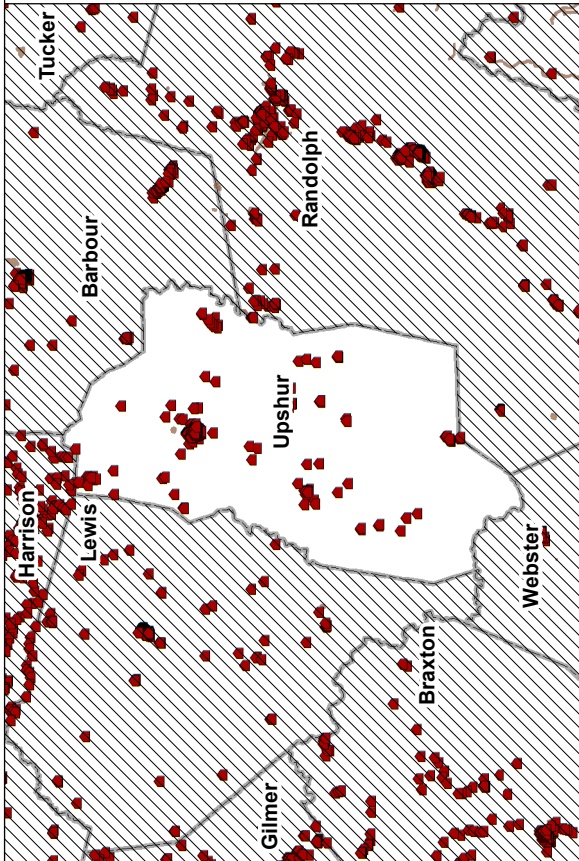
Source: West Virginia State Historic Preservation Office 2012

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# State Historic Architecture Upshur County



- State Historic Architecture
- Planning Regions Line
- State Historic Architecture (Area)
- County Boundaries

Source: West Virginia State Historic Preservation Office 2012

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## **Natural Resources, Environment, and Energy**

Particular importance should be given to the spatial positions of natural resource areas, geographic environments, and potential energy sources in a county. This serves to inform potential investors about what possibilities the land provides for production of resources and energy. Upshur County has several advantages in these areas that can be utilized to the advantage of the citizens.

West Virginia has an extensive wetlands inventory, because of its extensive system of lakes, streams, and rivers. Wetlands provide many environmental benefits, including housing fish, replenishing groundwater, and relaying nutrients. Upshur County's system is not very extensive, but does have one main line that traverses the county from the north to the central part of the county (Map 29).

The State also possesses a respectable amount of park and forest land. Most of this land is located in the eastern portion of the State, the area that contains the main part of the Appalachian Mountain range. Upshur contains no national or state parks or forest lands but does possess two wildlife management areas (Map 30).

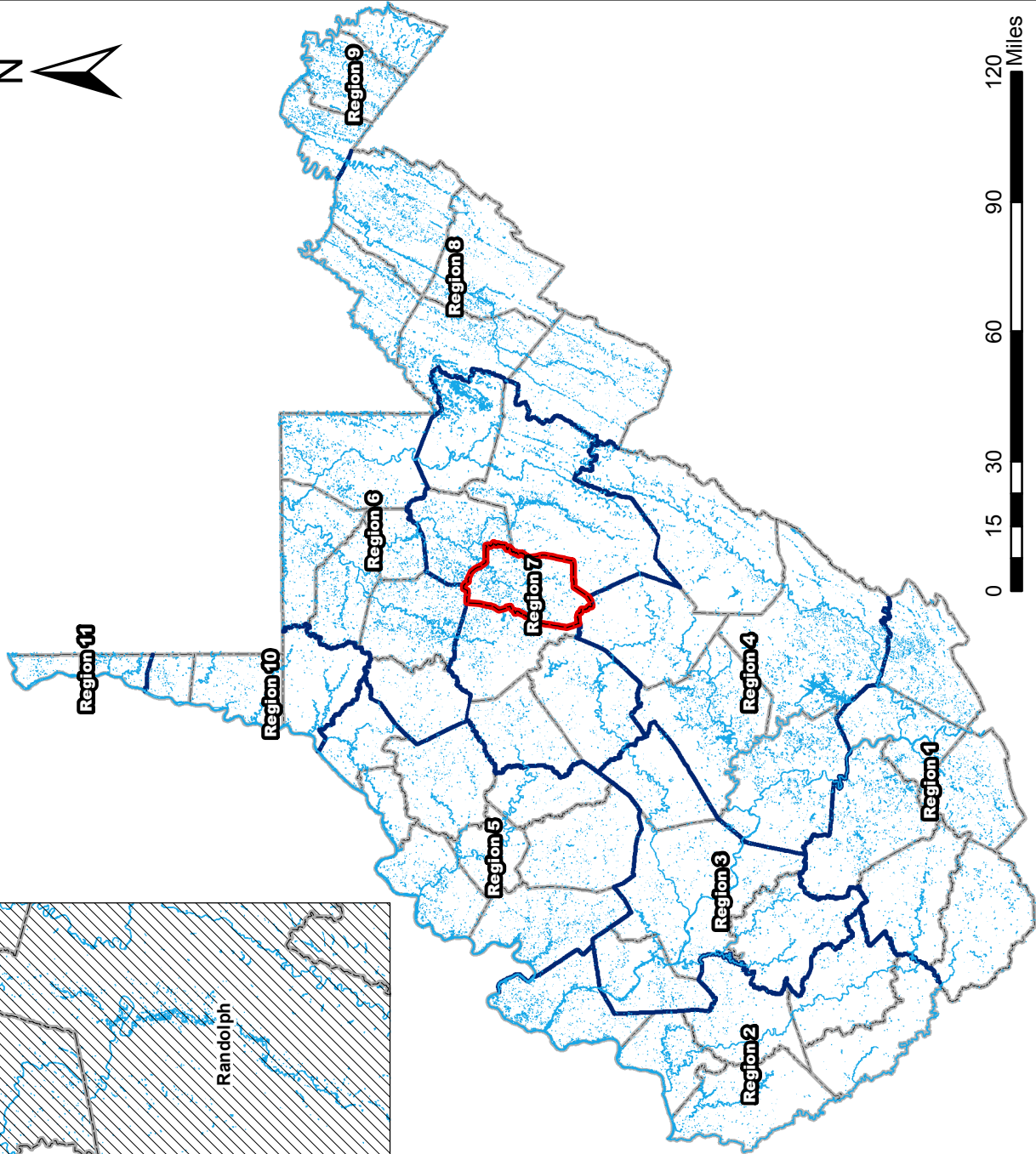
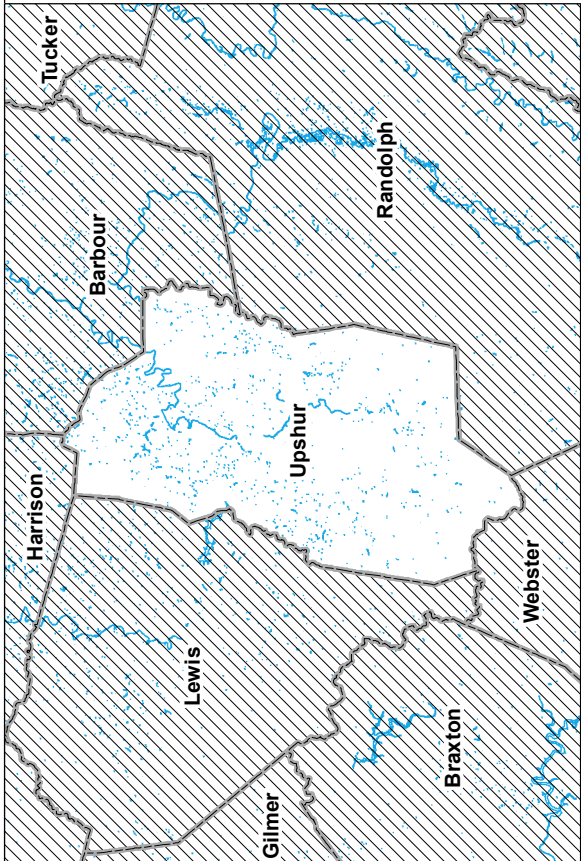
Air quality is a necessary environmental health benchmark that can determine the health and vitality of an area's residents. The air pollution non-attainment areas are "areas of the country where air pollution levels persistently exceed the national ambient air quality standards."<sup>7</sup> There are six full counties in West Virginia that are designated air pollution non-attainment areas, either in annual or 2006 24-hour standards as of the publication of this plan; Upshur County is not among them (Map 31).




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<sup>7</sup> "The Green Book Nonattainment Areas for Criteria Pollutants," Environmental Protection Agency, Accessed March 1, 2013, <http://www.epa.gov/oaqps001/greenbk/>.

# Hydrology - National Wetlands Inventory

Upshur County



-  Planning Regions Line
-  National Wetlands Inventory
-  County Boundaries



Source: United States Fish and Wildlife Service 1996

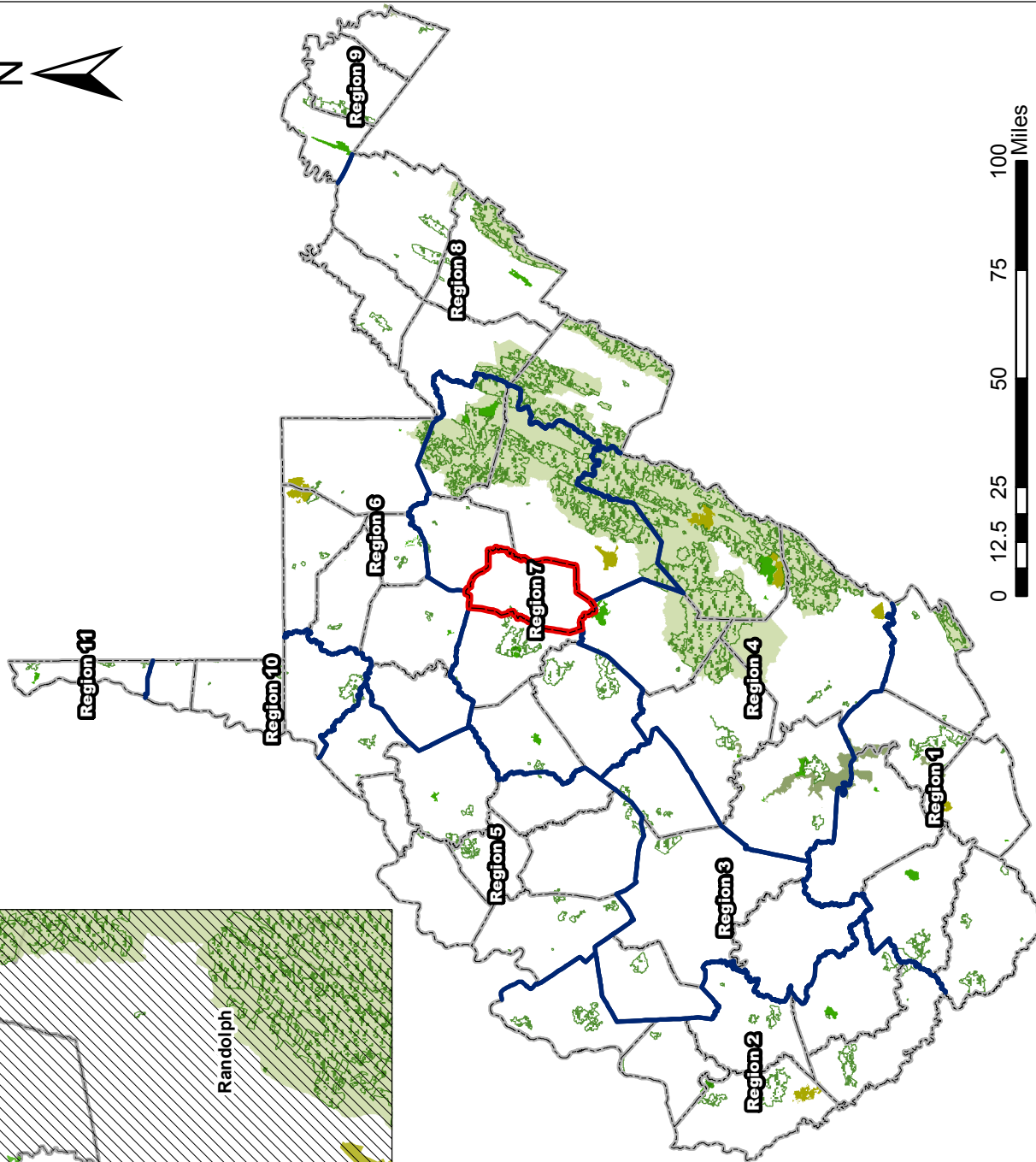
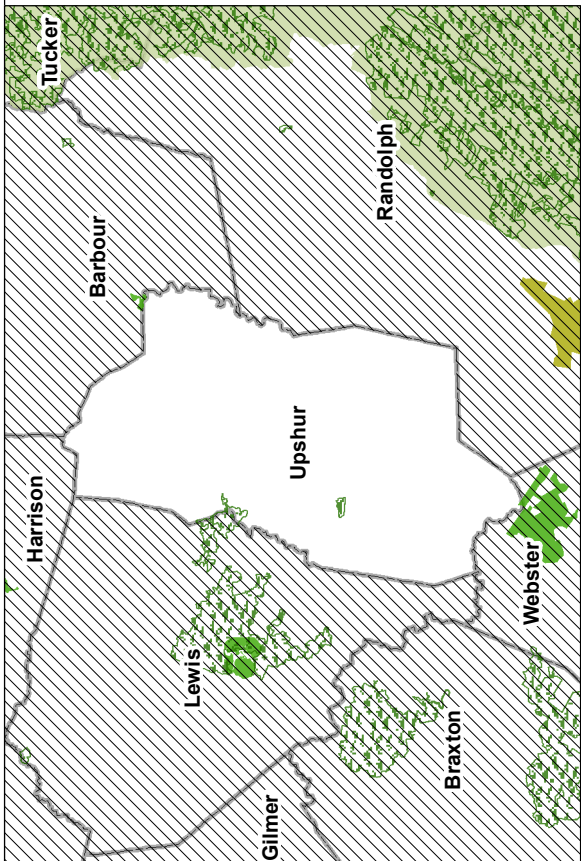
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# Public Land - Parks and Forests

## Upshur County



-  Planning Regions Line
-  Wildlife Management Areas
-  State Forest
-  State Park
-  National Forest
-  National Park
-  County Boundaries



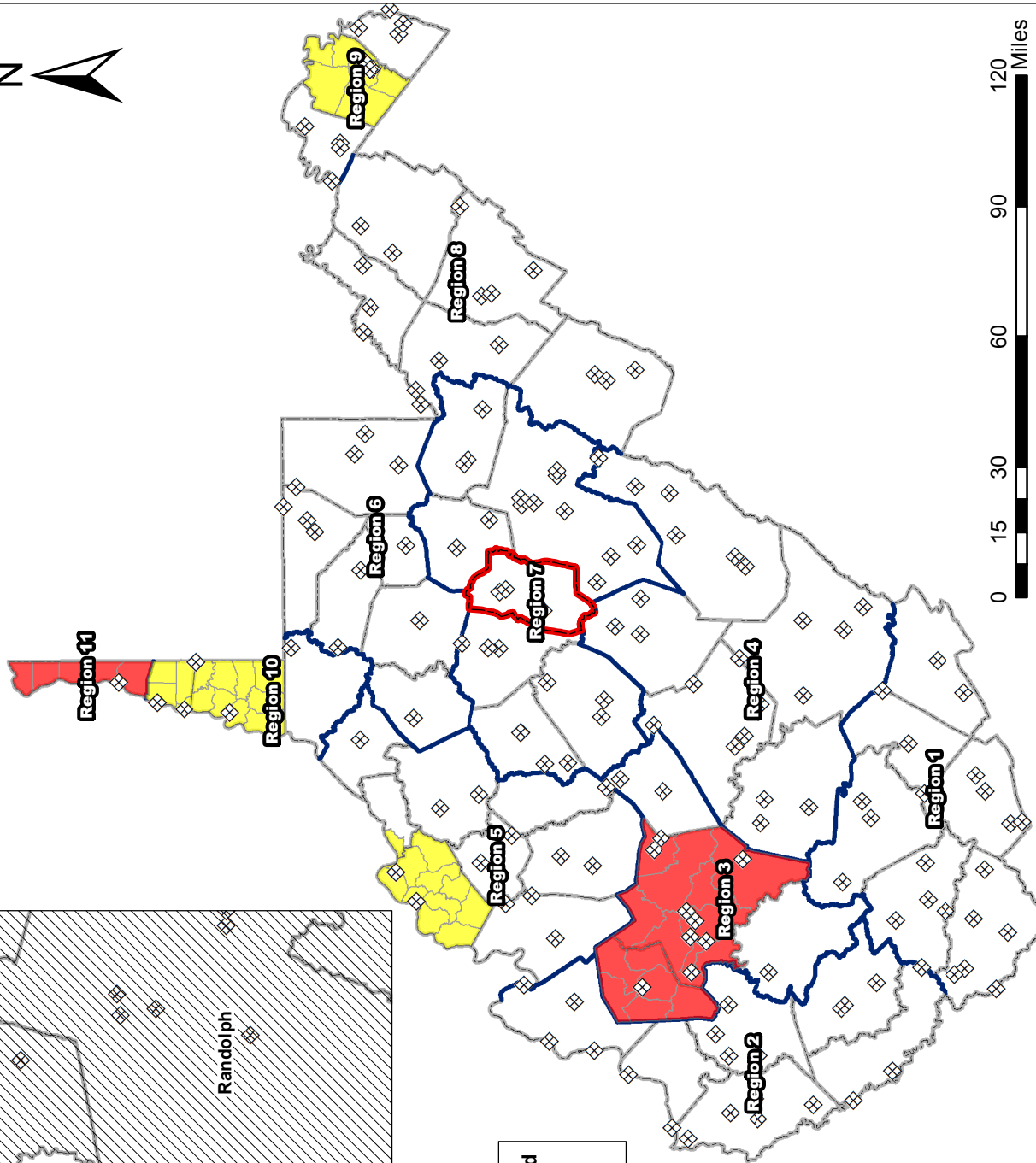
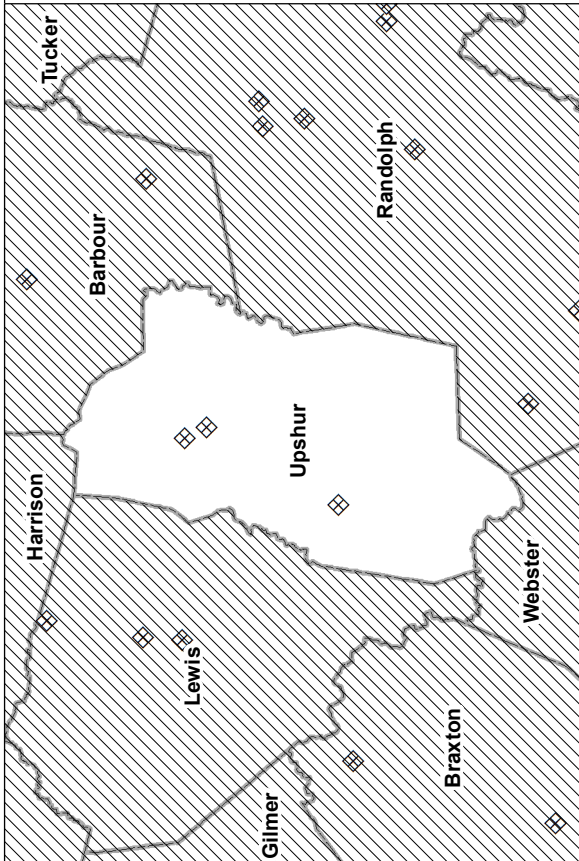
Source: Wildlife Management Areas: West Virginia Division of Natural Resources 2002; State Forest: West Virginia Division of Forestry 2004; State Park: West Virginia Division of Natural Resources; National Resource Analysis Center 2000; National Forest: United States Forest Service 2003; National Park: United States National Park Service 2003

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# Environment - Monitoring

Upshur County



On December 28, 2012, U.S.EPA re-designated Cabell and Wayne Counties and the Graham Tax District in Mason County to attainment for the 1997 NAAQS.

- ◇ Weather\_ Stations
- Planning Regions Line
- Air Pollution Non Attainment Areas**
  - PM2.5 Nonattainment Areas (for both the Annual and the 2006 24-hr Standards)
  - PM2.5 Nonattainment Areas (Annual)
  - County Boundaries

Source: Weather Stations; National Oceanic and Atmospheric Administration 1999; Air Pollution Non Attainment Areas; West Virginia Department of Environmental Protection and United States Environmental Protection Agency.

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West Virginia's past and most likely its future are defined by energy. Besides coal, other options for energy have been investigated in the State. Gas and oil are of course the main energy staples in the nation, and West Virginia has access to this sort of energy in a number of ways. Upshur County has no active oil fields or pipelines, but it does possess a long system of natural gas pipelines in the north and south (Map 32). Upshur County is also a player in the development of the Marcellus Shale, and has a number of wells (Map 33). The Marcellus Shale will continue to be a major player in West Virginia's energy layout for the foreseeable future, and as technology improves recoverability may also. Upshur has taken extensive advantage of its convenient location in the shale, and should continue doing so in the future.

Potential renewable energy sources were also examined. Wood byproducts are a potential energy source classified as biomass energy. Naturally it is most useful in areas with a great deal of wood products. West Virginia is one of the most forested States in the country. Upshur County is at the lowest end of the forest spectrum (Map 34). Still, it appears Upshur County is a middle player in producing energy by wood byproducts, but not for which byproducts are readily available (Maps 35 and 36). This juxtaposition may indicate efficiency in bark, chip, and sawdust production and that there may be some potential to develop this market further. Other potential renewable energy sources include geothermal (Map 37), solar (Map 38), and wind (Map 39). Each of these resources was examined in a recent report from the Center of Business and Economic Research at Marshall University.<sup>8</sup> None of these sources was "likely to provide fuel or electricity at a lower cost" than coal and oil. Subsidizing these resources appears to be the only way to encourage faster growth in consumption, and in some cases they still have very limited potential in West Virginia. Geothermal energy, however, appears to have great potential in certain parts of the State, as shown in Map 37, and Upshur is just on the edge of that most favorable area. However, Upshur appears to not be favorable for solar power development, and only a few sections of the county are "fair" for wind development. Still, technology is not predictable, and improvements could occur in each of these resource areas that will make generation more feasible. Efforts to monitor research in all these areas should be undertaken to make use of any potential developments.<sup>9</sup>

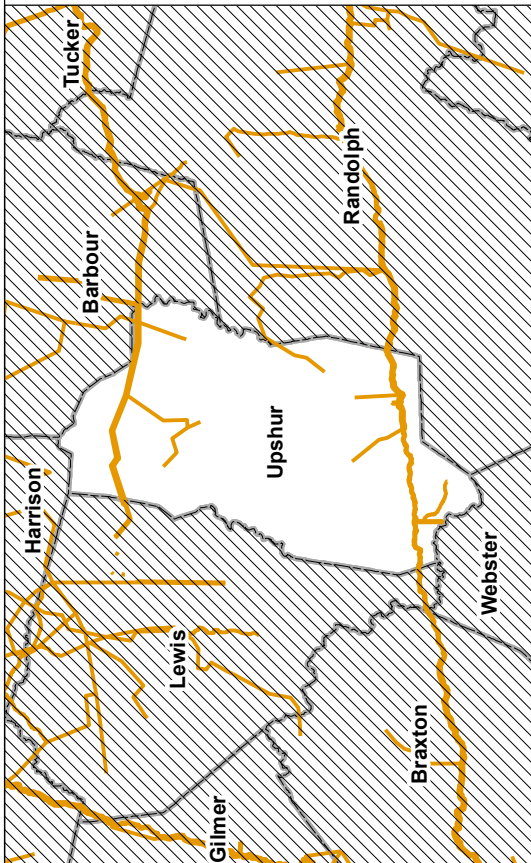
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<sup>8</sup> Kent, Calvin, Risch, Christine, and Pardue, Elizabeth. *Renewable Energy Policy: Opportunities for West Virginia*. Center for Business and Economic Research, Huntington, WV (2012).

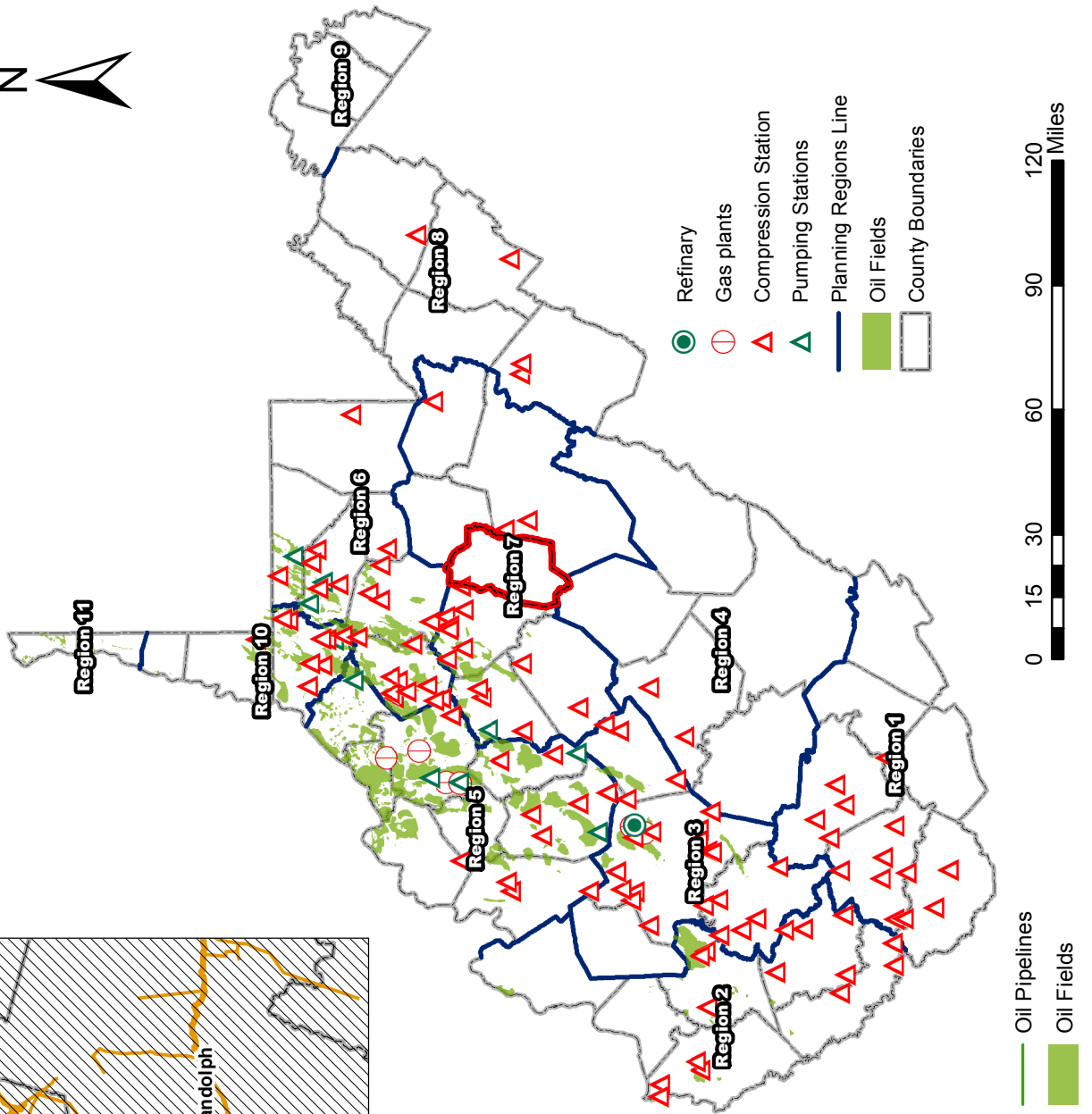
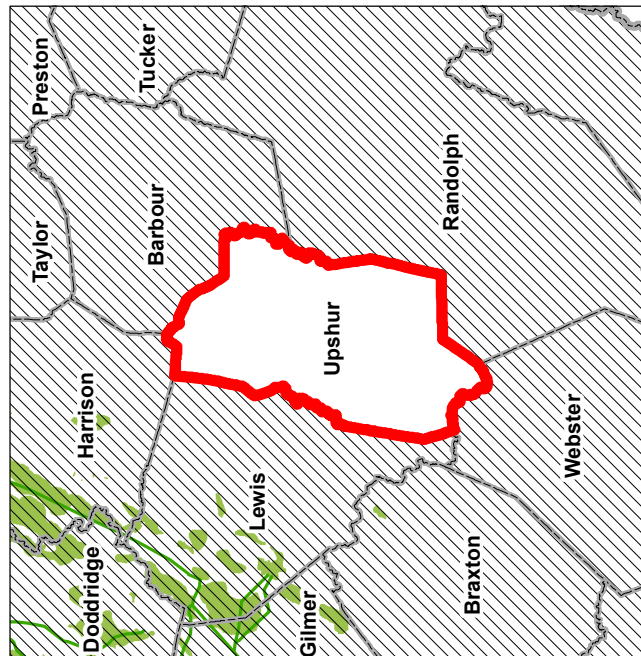
<sup>9</sup> Ibid.

# Energy - Gas and Oil

## Upshur County



— Gas Pipe



- Refinery
- Gas plants
- Compression Station
- Pumping Stations
- Planning Regions Line
- Oil Fields
- County Boundaries

— Oil Pipelines  
 Oil Fields

0 15 30 60 90 120 Miles

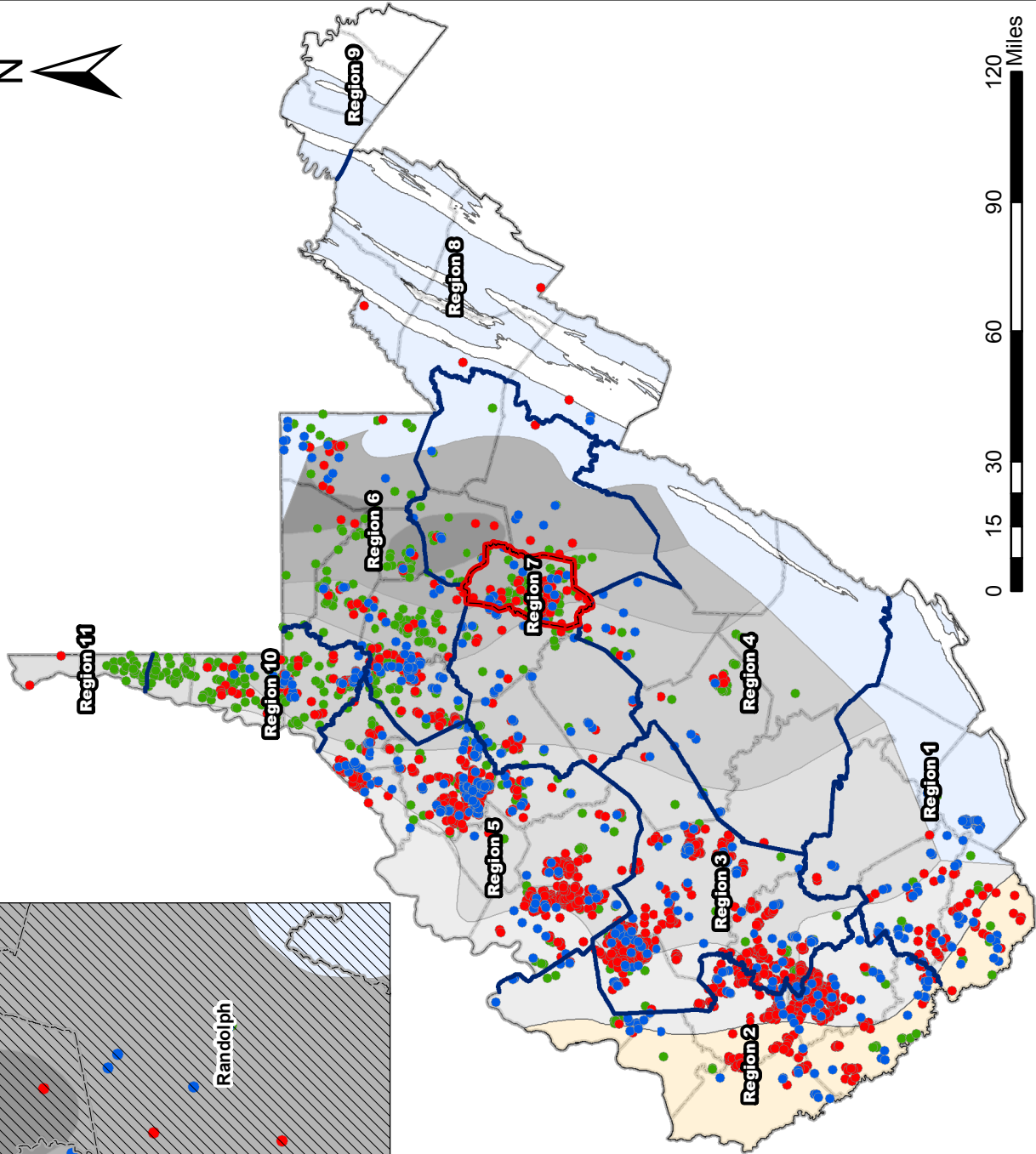
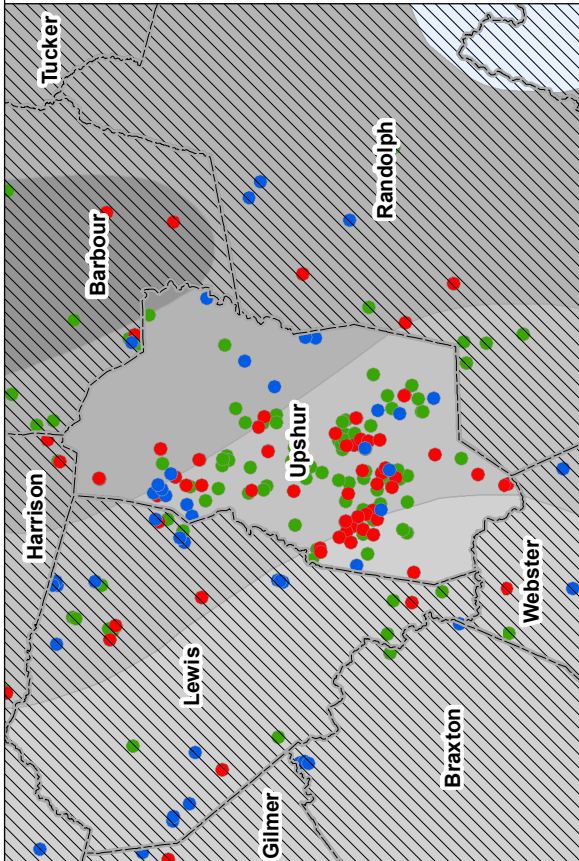
Source: West Virginia Geological and Economic Survey 2007

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# Energy - Marcellus Wells

## Upshur County



- Cancelled Marcellus Wells
- Completed Marcellus Wells
- Permitted Marcellus Wells
- Planning Regions Line
- 0 ft. - 20 ft.
- 21 ft. - 40 ft.
- 41 ft. - 60 ft.
- 61 ft. - 80 ft.
- 81 ft. - 100 ft.
- Over 100 ft.
- Possible/Uncertain Marcellus
- Uncertain thickness
- Marcellus assumed to be absent
- County Boundaries

Source: West Virginia Geological and Economic Survey 2012

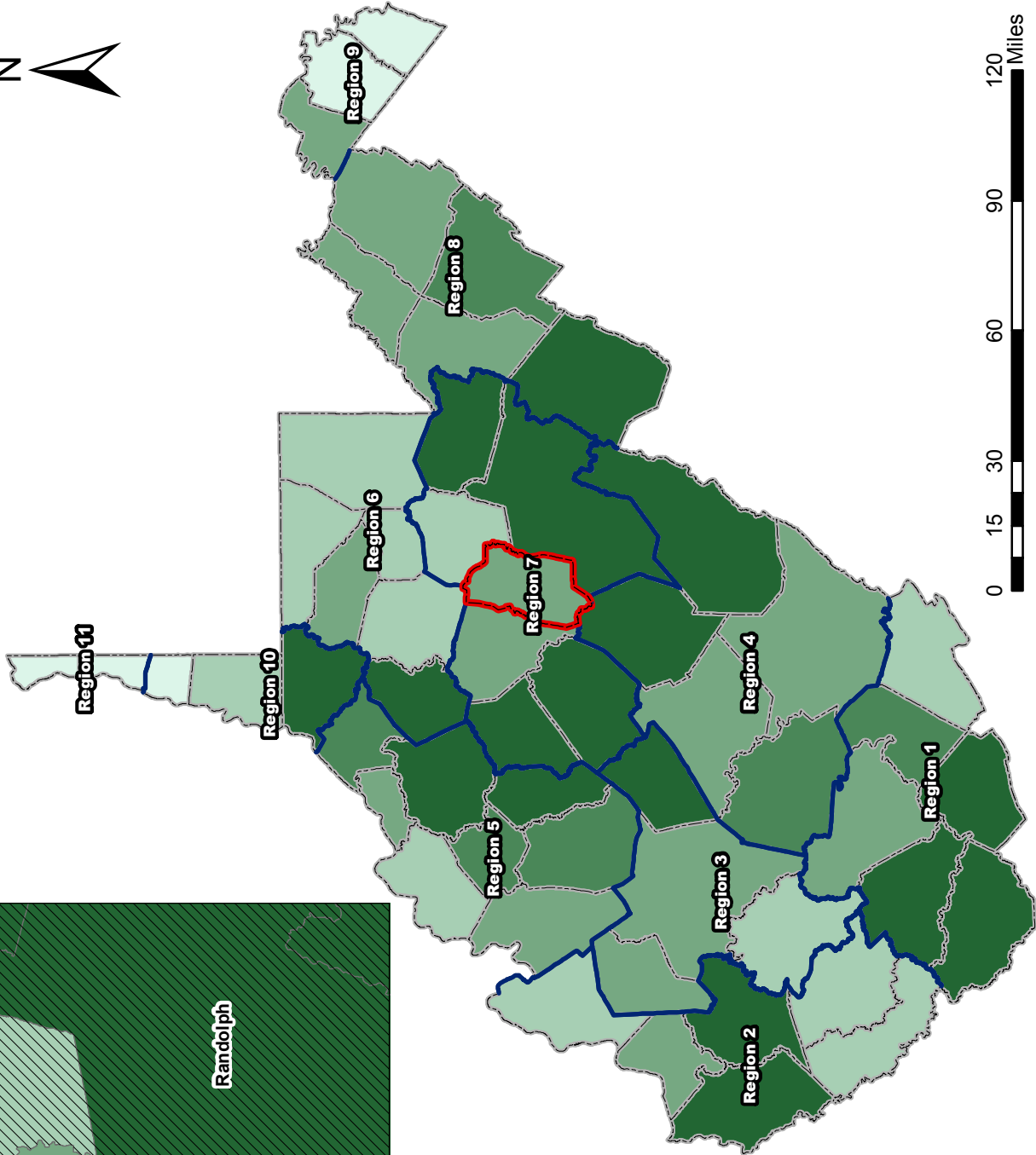
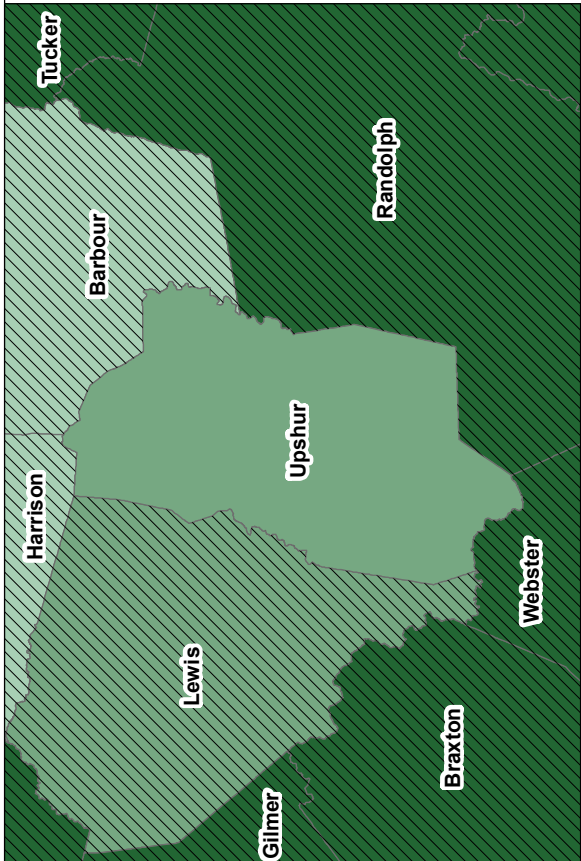
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# Energy - Percent Forest Coverage

Upshur County



- Planning Regions Line
- 45.87% - 65%
- 65.01% - 75%
- 75.01% - 82%
- 82.01% - 85%
- 85.01% - 100%
- County Boundaries

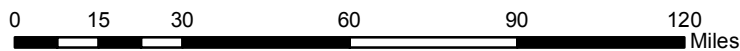
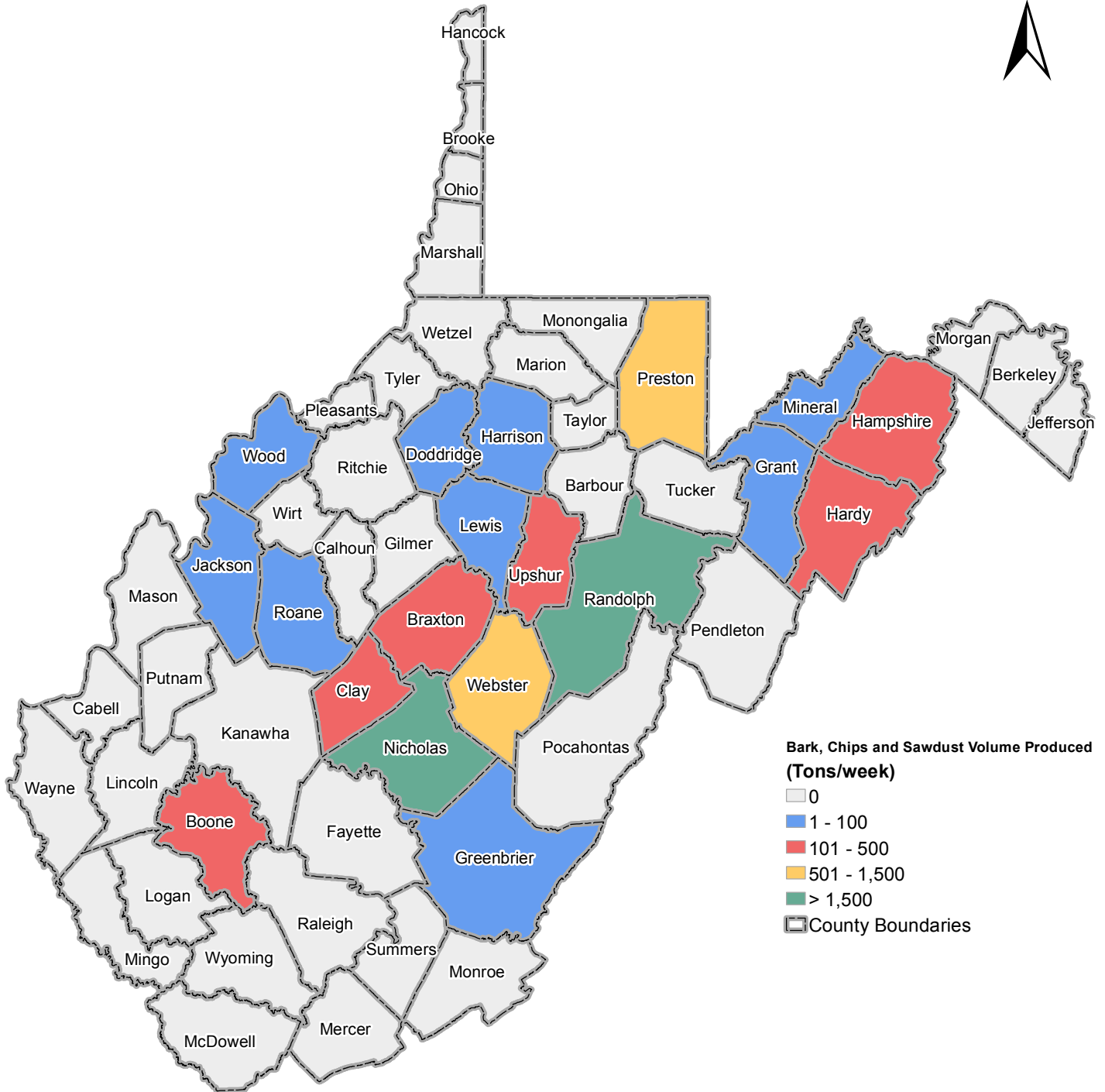
Source: Rahaal Transportation Institute 2013

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# Renewable Energy - Wood By Products

## Bark, Chip and Sawdust Volume Produced - Upshur County



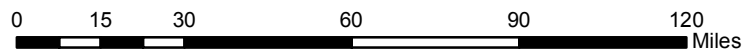
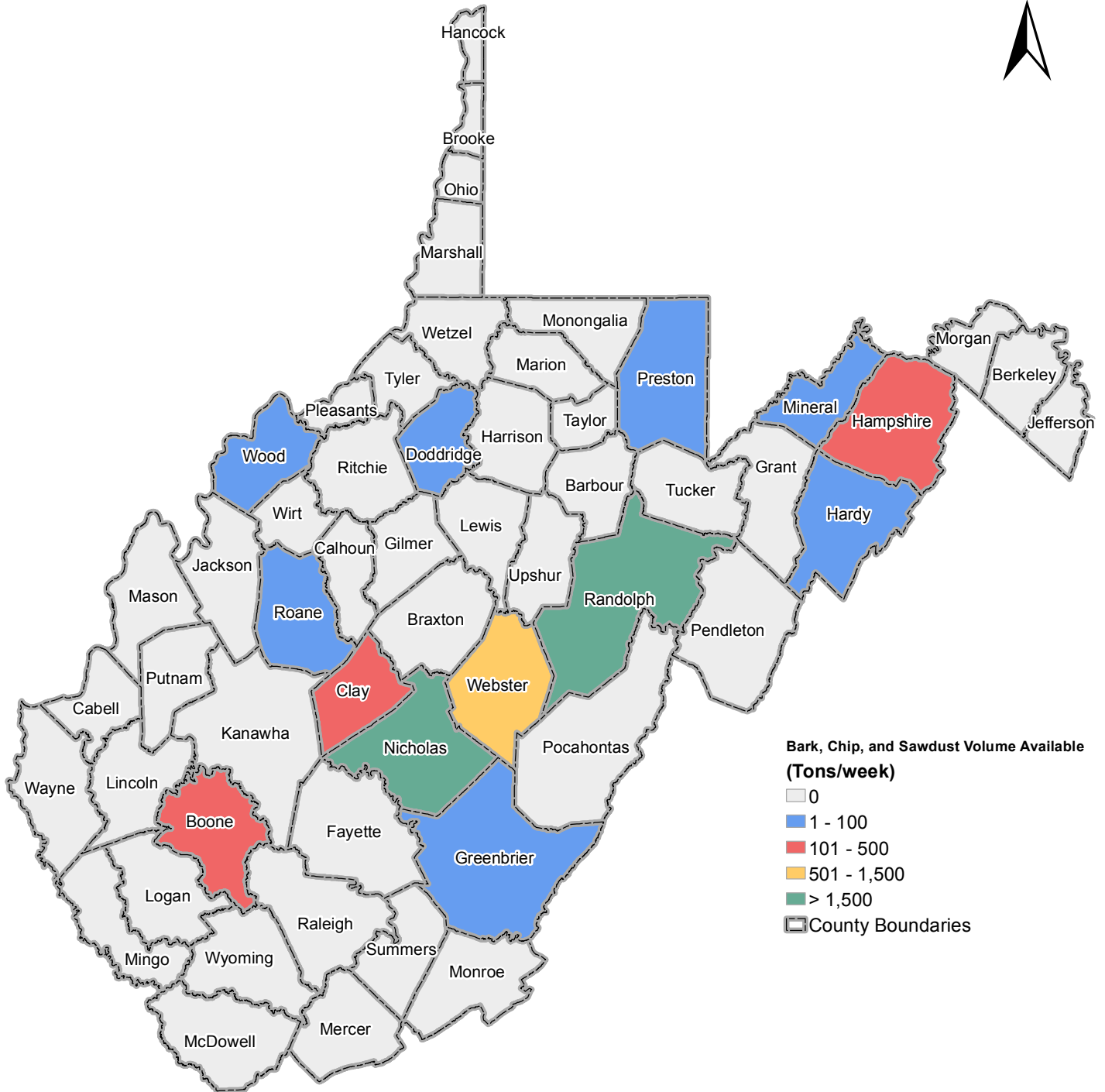
Source: Appalachian Hardwood Center 2011

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# Renewable Energy - Wood By Products

## Bark, Chip, and Sawdust Volume Available - Upshur County

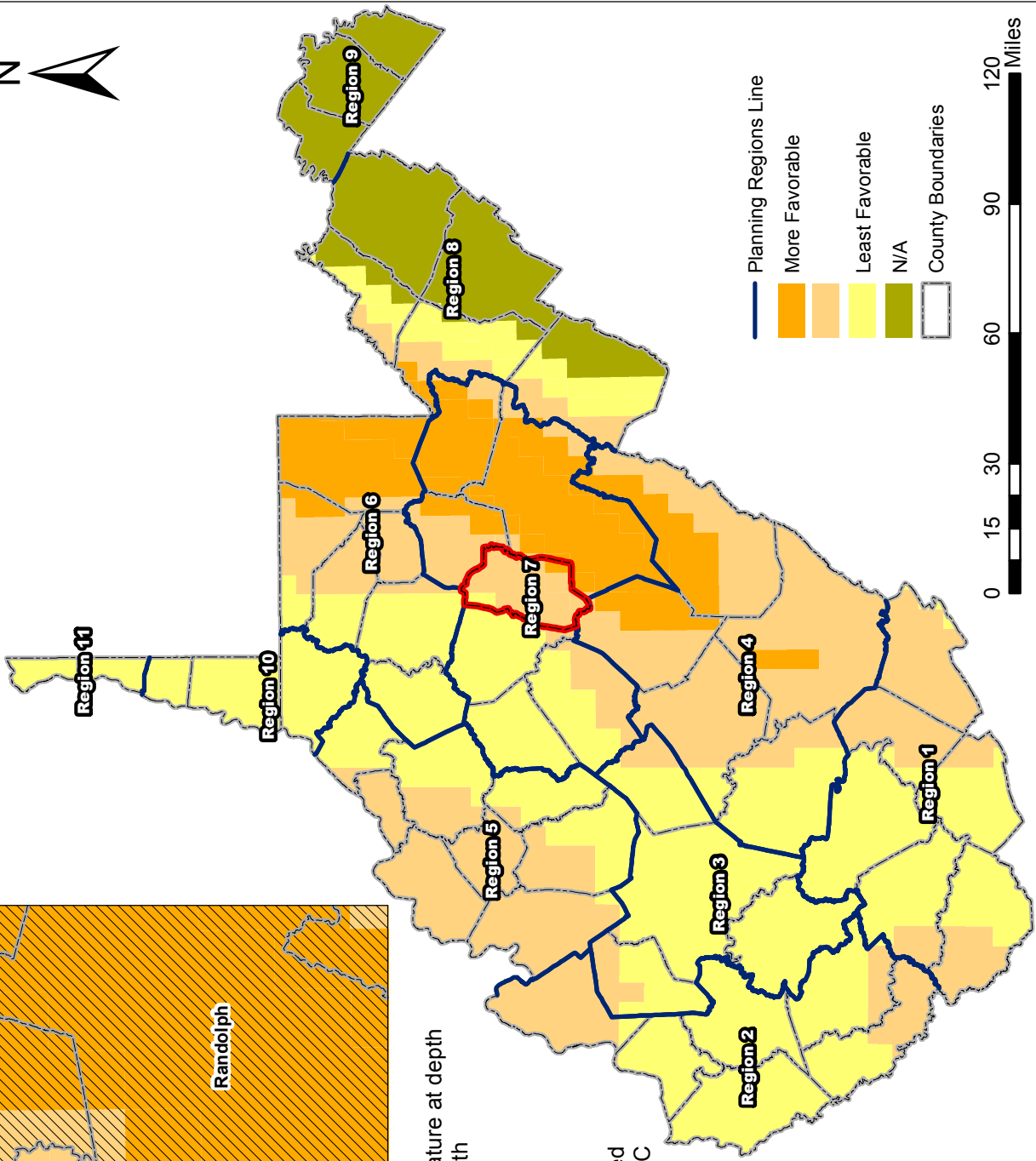
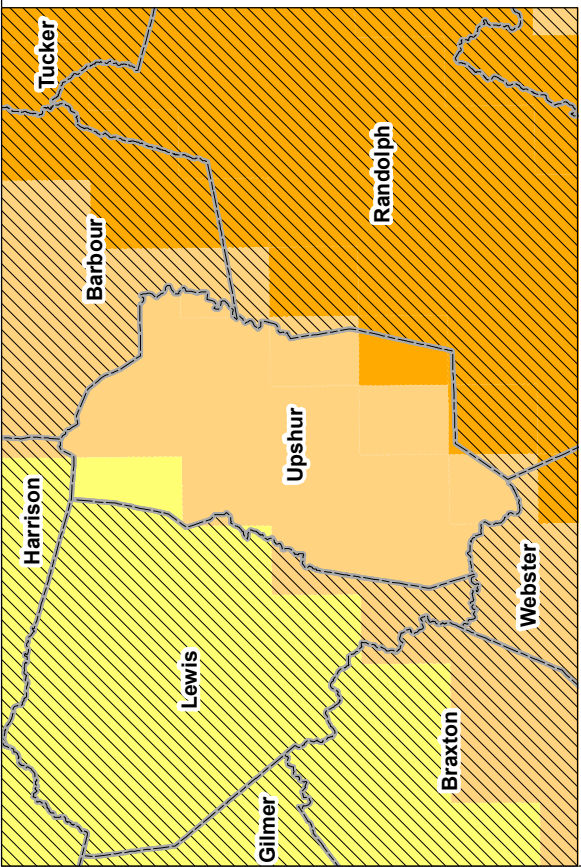


Source: Appalachian Hardwood Center 2011

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# Energy - Geothermal Resource of Upshur County Favorability of Deep Enhanced Geothermal Systems



— Source data for deep EGS includes temperature at depth from 3 to 10 km and analyses (for regions with temperatures  $\geq 150$  degrees C).

— Class values reflect relative favorability, with 1 being more favorable, 3 being least favorable, and "N/A" regions not having been assessed due to temperatures less than 150 degrees C at 10 km depth.

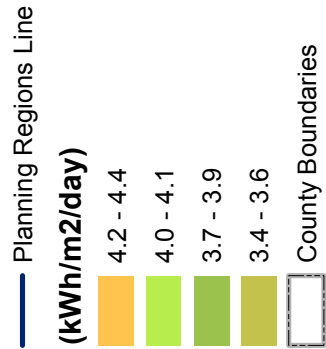
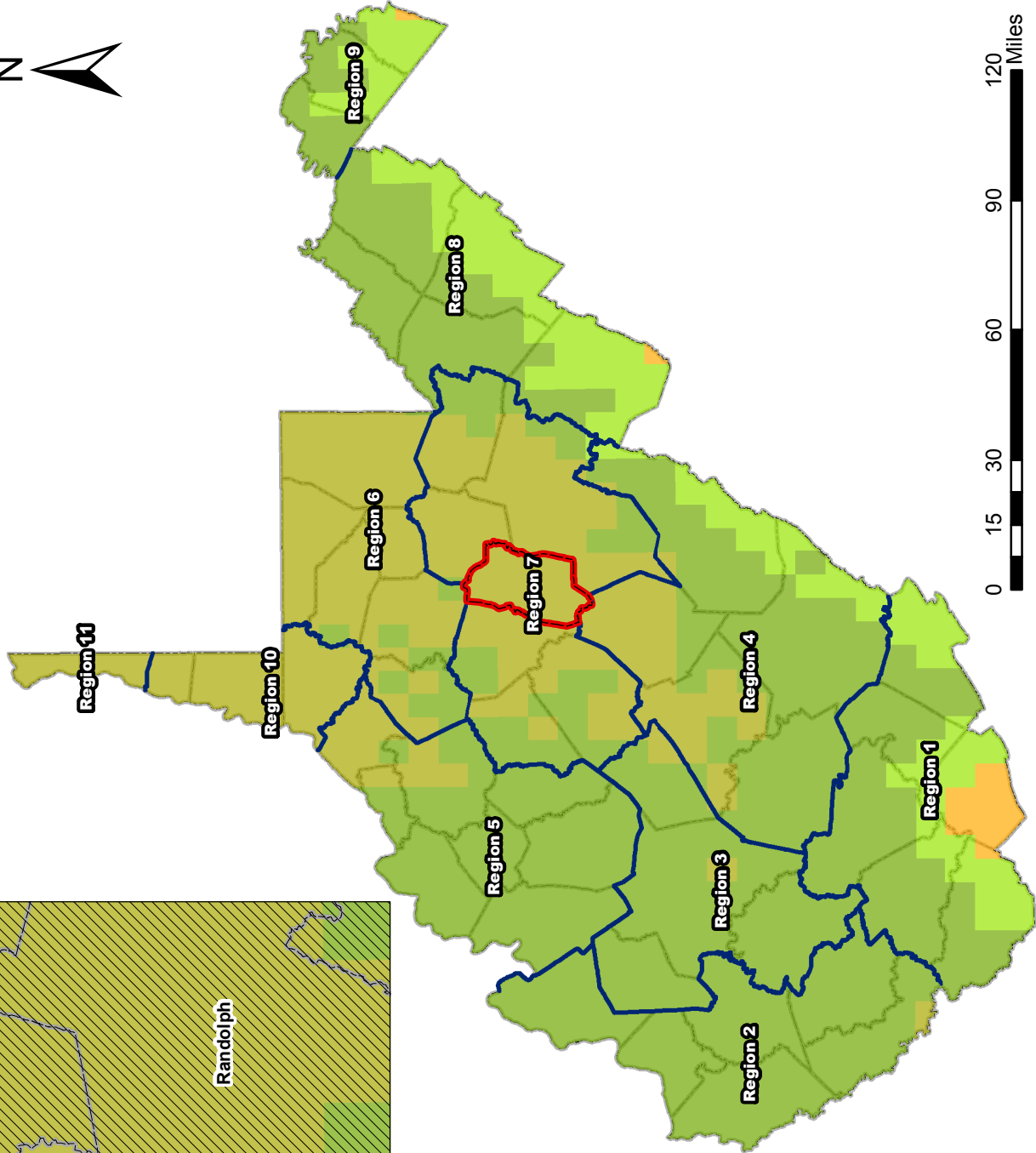
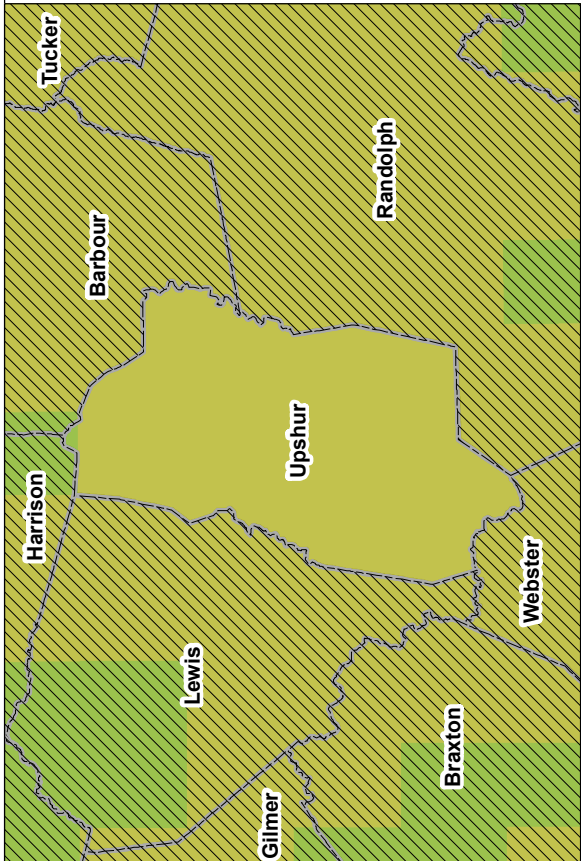
Source: National Renewable Energy Laboratory 2009

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# Solar - Renewable Energy

Upshur County

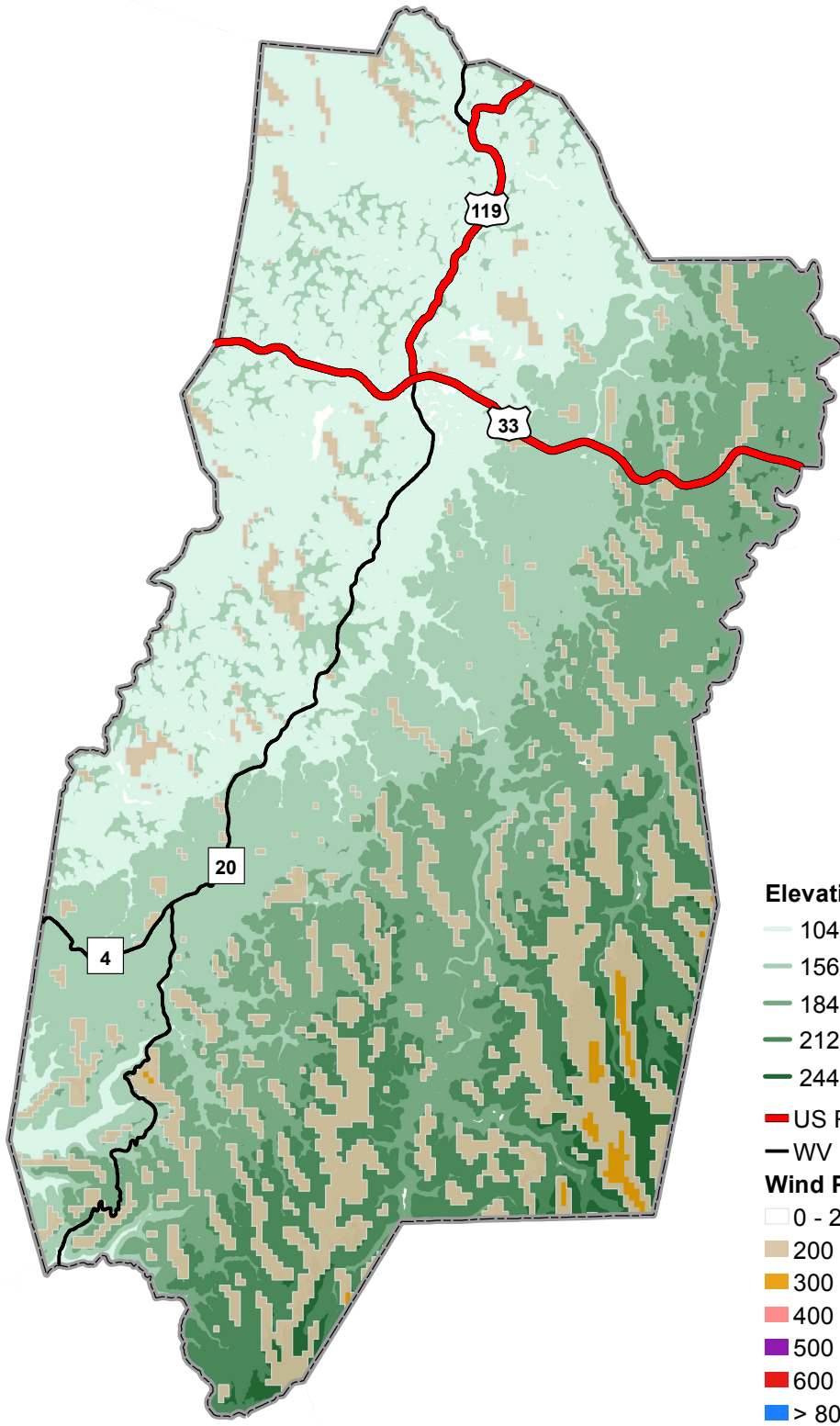


Source: National Renewable Energy Laboratory 2012

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# Renewable Energy-Wind

## Upshur County



### Elevation (Feet)

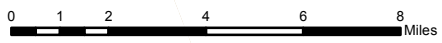
- 1040 - 1560
- 1561 - 1840
- 1841 - 2120
- 2121 - 2440
- 2441 - 3120

- US Routes
- WV Routes

### Wind Power Class Potential Density (W/m2)

- 0 - 200 Poor
- 200 - 300 Marginal
- 300 - 400 Fair
- 400 - 500 Good
- 500 - 600 Excellent
- 600 - 800 Outstanding
- > 800 Superb

□ County Boundary



Source: National Renewable Energy Laboratory 2006, United States Geological Survey n.d., ESRI, 2013

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#### IV. Land Use Smart Planning

The research team constructed a smart planning criterion that would apply to each mine site in Upshur. Tax Districts were utilized and labeled based on a particular land use practice that has previously been incorporated into the site. This criterion allows researchers and policymakers to determine suitability after weighing all the factors mentioned in the plan. A range of potential utilizations is given to give optimal control to policymakers and investors.

The table below (Table 2) provides the categories and their areas. The Smart Planning Map (Map 40) showcases the geographies separated by utilization.

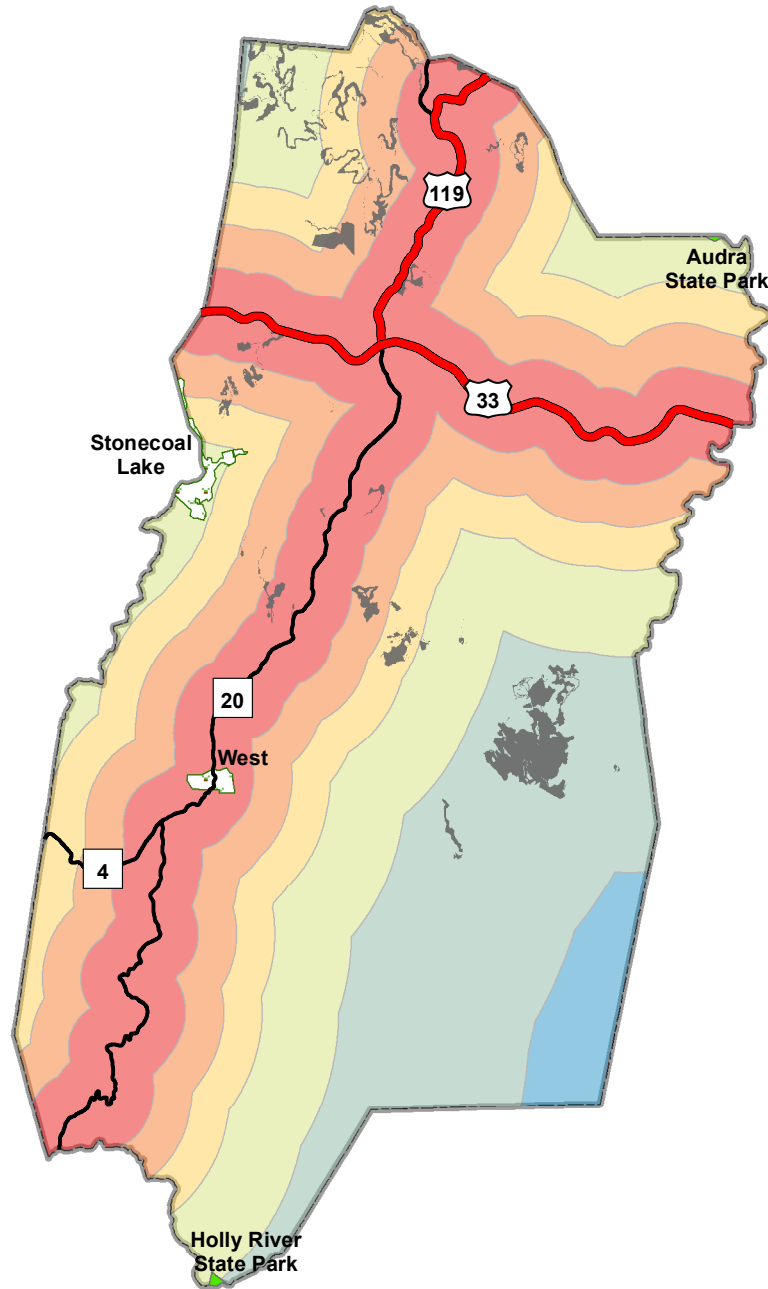
**Table 2: Smart Planning Utilizations**

Name	Smart Planning Criteria
Utilization Area 0-1 mile	Industrial, Commercial/Retail, Residential, Public Facility, Recreational
Utilization Area 1-2 miles	Industrial, Commercial/Retail, Residential, Public Facilities
Utilization Area 2-3 miles	Industrial, Commercial/Retail, Residential, Recreation
Utilization Area 3-5 miles	Industrial, Residential, Recreation, Agriculture, Forestland
Utilization Area 5-10 miles	Industrial, Residential, Agriculture, Forest Land
Utilization Area 10 miles +	Industrial, Residential, Agriculture, Forest Land

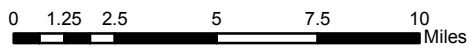
Land development or redevelopment options are determined through a review of the redevelopment authority's anticipated needs. The required infrastructure component standards are determined on a site by site basis by the county economic development authority as designated by West Virginia Code Chapter 05B Article 2A.

# Landuse Criteria

## Upshur County



- █ Interstate
- █ US Routes
- █ WV Routes
- █ Mining Permit Boundaries
- █ Wild Life Management
- █ State Park Boundaries
- █ State Forest Boundaries
- █ 0 to 1 Mile (Industrial; Commercial/Retail; Residential; Public Facilities; Recreation)
- █ 1 to 2 Miles (Industrial; Commercial/Retail, Residential; Public Facilities)
- █ 2 to 3 Miles (Industrial; Commercial/Retail, Residential; Recreation)
- █ 3 to 5 Miles (Industrial; Residential; Receration; Agriculture; Forestland)
- █ 5 to 10 Miles (Industrial; Residential; Agriculture; Forest Land)
- █ 10+ Miles (Industrial; Residential; Agriculture; Forest Land)
- County Boundary



Source: Rahall Transportation Institute 2013

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## V. Site Evaluation

Once the smart planning buffers have been created, the sites available for analysis are confirmed. This evaluation provides the county with an inventory of post mine sites that are suitable for development. The evaluation consists of existing infrastructure availability, which gives the most accurate assessment of a site's physical capabilities for investment purposes. This will encourage strategic development and evaluation.

### **Initial Data Collection:**

The consulting team collected all available data on surface mines sites located in Upshur County to produce an inventory of sites for analysis. The source for site information was primarily the West Virginia Department of Environment Protection (WV DEP) website, which allows permit searches by geographic location and mining type. The information provided by this source was used to develop a preliminary property database of all surface mines as well as general mapping.

Initial data collection showed the number of mine sites in the county. Some of them are active sites where mining is currently going on and other sites are in various phases of bond. The potential mining site for development is the one that is not complete released or still active. There are 4 potential mining sites for development in Upshur County, which are included in the following table.

**Table 3: Upshur County Potential Surface Mine Sites for Development**

Site No.	Permittee	Permit_ID	Facility Name	Acres	Expiration Date	Nearest Post Office
1	Jerry Stalnaker Coal Company Inc	S200799	Rice Surface Mine Operation	57.63	5/19/05	Buckhannon
2	Marion Docks, Inc.	S200892	Unknown	57.84	11/30/02	Century
3	Nesco, Inc.	S200604	Lane Ridge Surface Mine	161	1/27/15	Adrian
4	Upshur Property, Inc.	S005780	Upshur Complex	580.9	7/31/97	Tallmansville

**Site Analysis (Distance Analysis)**

Once the surface mining sites in the county were identified each of the sites were evaluated by estimating the shortest distance from the site to a specified criteria (features which are important to development). There are two types of distance calculation in this analysis: road-path and Euclidean distance. Road-path distance is the distance when travelling on an actual roadway from the site to the feature; Euclidean distance is when the distance is a straight line from the site to the feature, without the necessity of following a roadway. Following are lists of criteria used in the analysis:

- Road-path Distances:
  - Distance to nearest roadway (Interstate, Existing Highway, Proposed Highway...)
  - Distance to major airports (Tri-State, Yeager)
  - Distance to Intermodal Terminal Facility and Huntington Port
  - Distance to nearest Sewer/ Solid Waste Treatment Facility
  
- Euclidean Distances:
  - Distance to Water Lines, Sewer Lines, Power Lines and Broadband
  - Distance to Gas Pipe and Oil Pipe
  - Distance to Railroad, National Waterway Network

The following tables illustrate the results of these assessments for all of the identified sites. All distances were recorded in miles.

**Table 4: Assessment of Distances**

Site No.	Permit_ID	Interstate (IS)	Name - IS	Existing Highway (EH)	Name - EH	Paved Road	Paved Road Name	Coal Express Highway
1	S200799	12.85	I79	0.24	US-119	0.234	US 119	103.85
2	S200892	11.16	I79	0.17	S20	0.169	WV 20	108.13
3	S200604	16.01	I79	3.10	S20	0.373	Tallmansville Road	96.88
4	S005780	23.18	I79	4.74	US-33	0.005	Tallmansville, Queens Hemlock and Palace Valley	97.18

**Table 5 Distances from Sites to Major Airports**

Site No.	Permit_ID	Permittee	Tri-State	Yeager
1	S200799	Jerry Stalnaker Coal Company Inc	134.37	86.85
2	S200892	Marion Docks, Inc.	136.19	89.58
3	S200604	Nesco, Inc.	131.00	82.23
4	S005780	Upshur Property, Inc.	135.11	85.54

**Table 6: Shortest Distances from Sites to Other Transportation Methods**

Site No.	Permit_ID	Railroad (RR)	Owner (RR)	Intermodal Terminal Facility (CSXT)	National Waterway Network (Rivers)	Name-Rivers	Pittsburgh Port
1	S200799	1.24	CSXT	24.31	31.07	Monongahela River	98.36
2	S200892	1.18	CSXT	18.25	26.24	Monongahela River	93.52
3	S200604	0.29	CSXT	33.66	38.64	Monongahela River	105.93
4	S005780	2.38	CSXT	38.13	41.45	Monongahela River	108.62

**Table 7: Shortest Distances from Sites to Sewer Lines (SL) and Water Lines (WL)**

Site No.	Permit_ID	Sewer Lines	Public Utility - SL	Water Lines	Public Utility - WL
1	S200799	1.92	Tennerton Public Service District	0.23	Hodgesville Public Service District
2	S200892	6.60	Tennerton Public Service District	0.17	Hodgesville Public Service District
3	S200604	2.44	Tennerton Public Service District	0.37	Adrian Public Service District
4	S005780	7.10	Tennerton Public Service District	0.00	Mount Hope Water Association

**Table 8: Shortest Distances from Sites to Broadband and Power Lines**

Site No.	Permit_ID	Broadband	Provider	Power Lines	Type	Size_kV
1	S200799	0.57	Cequel III Communications II	0.40	Transmission	115-138
2	S200892	0.69	Frontier West Virginia, Inc.	0.13	Sub-Transmission	Unknown
3	S200604	3.34	West Side Telephone Company	0.09	Transmission	115-138
4	S005780	2.12	West Side Telephone Company	0.64	Transmission	115-138

**Table 9: Shortest Distances from Sites to Sewer and Solid Waste Treatment Facilities**

Site No.	Permit_ID	Sewer Treatment (ST)	Facility Name (ST)	Solid Waste Treatment (SWT)	Facility Name (SWT)
1	S200799	3.20	Buckhannon, City of	3.02	Buckhannon, City of
2	S200892	7.65	Buckhannon, City of	3.70	Hodgesville Elementary
3	S200604	8.98	City of Buckhannon	4.14	Washington Elementary
4	S005780	13.46	City of Buckhannon	5.00	Washington Elementary

**Table 10: Shortest Distances from Sites to Gas Pipe and Oil Pipe**

Site No.	Permit_ID	Gas Pipe (GP)	Company Name (GP)	Oil Pipe (OP)	Company Name (OP)
1	S200799	1.20	Columbia Gas Transmission Corp.	0.64	CL
2	S200892	2.40	Columbia Gas Transmission Corp.	0.96	CN
3	S200604	4.01	Columbia Gas Transmission Corp.	1.93	CL
4	S005780	1.11	Columbia Gas Transmission Corp.	5.00	CL

## **Suitability Model**

The suitability model for Upshur County is created with a weighted scoring method. The method scores options against a prioritized requirements list to determine which option best fits the selection criteria. Using a consistent list of criteria, weighted according to the importance or priority of the criteria to the researcher, a comparison of similar “products” can be completed. If numerical values are assigned to the criteria priorities (**weighting**) and the ability of the product to meet a specific criterion (**scoring**), a “score” can be derived. By summing the score (**total score**), the product most closely meeting the criteria can be determined.

Criteria are chosen and weighted based on published Land Use Master Plans (LUMPs) for several counties in West Virginia, our own research on the existing conditions in Upshur County and expert advice about important factors to site development.<sup>10</sup> Then, scores for each site are given by comparing the closest distance from the site to all factors within given distance thresholds. There are three sets of scores in this suitability model: **absolute scores**, **relative scores** and the **total score**.

*Absolute scores* are given by comparing certain distance thresholds with the results of GIS Distance Analysis. Thresholds are determined mainly based on the researcher’s experience, characteristics of the considered criteria and the priority given to the criteria. For example, if the closest distance from a site to an interstate ranges from 5 to 10 miles, the site will be given 7 points for the Interstate Criteria. Absolute scores will directly affect the site selection. Different score categories may result in significant change in the cost of investment, and will thus impact the county’s decisions.

*Relative scores*, on the other hand, depend solely on the closest distances of sites to relative criteria features. Initially, statistical values will be computed according to distance values from all sites to a certain factor (criteria), including min, quartile 1 – Q1, quartile 2 – Q2, quartile 3 – Q3, and max. Then, distance values will be classified into four groups and given the scores shown in Table 13 (below). This score set is used to sharpen difference between all sites in a certain category and therefore aid the decision maker. For example, two sites may have the same absolute score (in the same range of miles) but may fall in different statistical groups. Then the two sites will have different relative scores.

---

<sup>10</sup> Joseph, M. (2006). A Decision-Support Model of Land Suitability Analysis for the Ohio Lake Erie Balanced Growth Program. EcoCity Cleveland.

The total score is a combination of weights, absolute scores, and relative scores. The following equation is used to calculate the total score of a certain studied site:

$$\text{Total score of site A} = \sum (\text{absolute score} \times \text{relative score} \times \text{weight})_{ci} / 10 \quad (\text{ci: criteria i})$$

Sites with higher total scores reveal a higher chance of being developed. Total score will vary according to a combination of three components: weights, absolute scores, and relative scores. In this report, total scores are calculated by the linear equation indicating that all components are treated equally.

### 1. Weighting

Table 11 prioritizes post-mining land-use criteria for surface coal mining site selection in Upshur County. Criteria weights are assigned on a one-to-ten scale. According to Joseph, utilities (power, water, and sewer) and road networks are considered more important factors to development. Therefore, those factors receive higher weights (7-10) in the suitability model. On the other hand, decision-makers are less affected by factors such as airports, national waterways, and ports. Those factors may be good supplements but do not critically change the investments.

**Table 11: Weighting Sites Selection Criteria**

No	Criteria	Weight
1	Interstate	8
2	Existing Highway	8
3	Proposed Highway	9
4	Yeager Airport	3
5	Tri-state Airport	3
6	National Waterway Network Ports	5
7	Sewer Treatment Facilities	7
8	Solid Waste Treatment Facilities	8
9	National Waterway Network	4
10	Intermodal Terminal Facilities	6
11	Sewer Lines	8
12	Railroads	5
13	Water Lines	10
14	Power Lines	10
15	Gas Pipes	6
16	Pipe Lines	6
17	Broadband	9

## 2. Scoring

### 2.1 Absolute Scores:

The shorter the distance to a feature from a site, the higher absolute score the site receives. Table 12 describes the thresholds and score categories for each criterion, ranging from 1 to 10. In order to achieve a better comparison between sites, the score scale is evenly distributed between five distance groups (1-3-5-7-10).

As mentioned above, thresholds are mainly defined based on researcher experience, traveling method from a site to the features (road-path vs. Euclidean), and characteristic of criteria (type of feature, priority, and density). For example, distance thresholds for “Solid Waste Treatment Facilities” are much smaller than ones for “Intermodal Terminal Facilities”. This is because treatment facilities are much denser than intermodal terminal facilities. In addition, solid waste facilities are considered more important in site selection (weight: 8 vs. 6).

**Table 12: Absolute Scoring System**

Absolute Score		10	7	5	3	1
Criteria (Distances in miles)	Existing Highway	0 - 5	5 - 10	10 - 15	15 - 20	> 20
	Proposed Highway	0 - 5	5 - 10	10 - 15	15 - 20	> 20
	Intermodal Terminal Facilities	0 - 10	10 - 20	20 - 30	30 - 40	> 40
	Interstate	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	National Waterway Network Ports	0 - 30	30 - 50	50 - 70	70 - 90	> 90
	Sewer Treatment Facilities	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	Solid Waste Treatment Facilities	0 - 5	5 - 14	14 - 22	22 - 30	> 30
	Tri-State Airport	0 - 30	30 - 50	50 - 70	70 - 90	> 90
	Yeager Airport	0 - 30	30 - 50	50 - 70	01 - 90	> 90
	Broadband	0 - 0.5	0.5 - 2	2 - 3	3 - 4	> 4
	Gas Pipe (Natural Gas)	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	National Network Waterway	0 - 2.5	2.5 - 5	5 - 7.5	7.5 - 10	> 10
	Power Lines	0 - 0.5	0.5 - 1.5	1.5 - 2	2 - 2.5	> 2.5
	Pipe Lines (Oil)	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1
	Railroads	0 - 1	1 - 3	3 - 4	4 - 5	> 5
Sewer Lines	0 - 1	1 - 3	3 - 4	4 - 5	> 5	
Water Lines	0 - 0.25	0.25 - 0.5	0.5 - 0.75	0.75 - 1	> 1	



## 2.2 Relative Scores:

Table 13 shows four statistical groups and their relative scores in the Upshur County land suitability model. The total number of coal mining sites will be equally distributed in each group. The relative score differs from the absolute score in two ways. First, thresholds for relative scores are derived only from real distances from the sites to the features (criteria). It is not affected by personal opinion and does not consider either traveling method or nature of criteria.

**Table 13: Relative Scoring System**

		<b>Threshold (Distances in miles)</b>				
		<b>Min - Q1</b>	<b>Q1 - Q2</b>	<b>Q2 - Q3</b>	<b>Q3 – Max</b>	
		10	7.5	5	2.5	
<b>No.</b>	<b>Criteria</b>	<b>Min</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Max</b>
1	Interstate	0.17	4.74	0.19	1.67	4.33
2	Existing Highway	96.88	108.13	96.95	100.52	107.06
3	Proposed Highway	18.25	38.13	19.77	28.98	37.01
4	Yeager Airport	11.16	23.18	11.58	14.43	21.39
5	Tri-State Airport	93.52	108.62	94.73	102.14	107.95
6	National Waterway Network Ports	3.20	13.46	4.31	8.31	12.34
7	Sewer Treatment Facilities	3.02	5.00	3.19	3.92	4.78
8	Solid Waste Treatment Facilities	131.00	136.19	131.84	134.74	135.92
9	National Waterway Network	82.23	89.58	83.06	86.20	88.90
10	Intermodal Terminal Facilities	0.57	3.34	0.60	1.40	3.03
11	Sewer Lines	1.11	4.01	1.13	1.80	3.61
12	Railroads	26.24	41.45	27.45	34.86	40.75
13	Water Lines	0.09	0.64	0.10	0.26	0.58
14	Power Lines	0.64	5.00	0.72	1.44	4.23
15	Gas Pipes	0.29	2.38	0.51	1.21	2.10
16	Pipe Lines	1.92	7.10	2.05	4.52	6.97
17	Broadband	0.00	0.37	0.04	0.20	0.34

### 3. Upshur County's Suitability Model:

Table 14 shows the total scores of all studied sites in Upshur County. Site No-1 (Permit ID = S200799) has the highest score of 659.5. The sites with higher total scores suggest better opportunities for development. Results in Table 14 are also plotted in the bar chart (Figure 15) for better visualization.

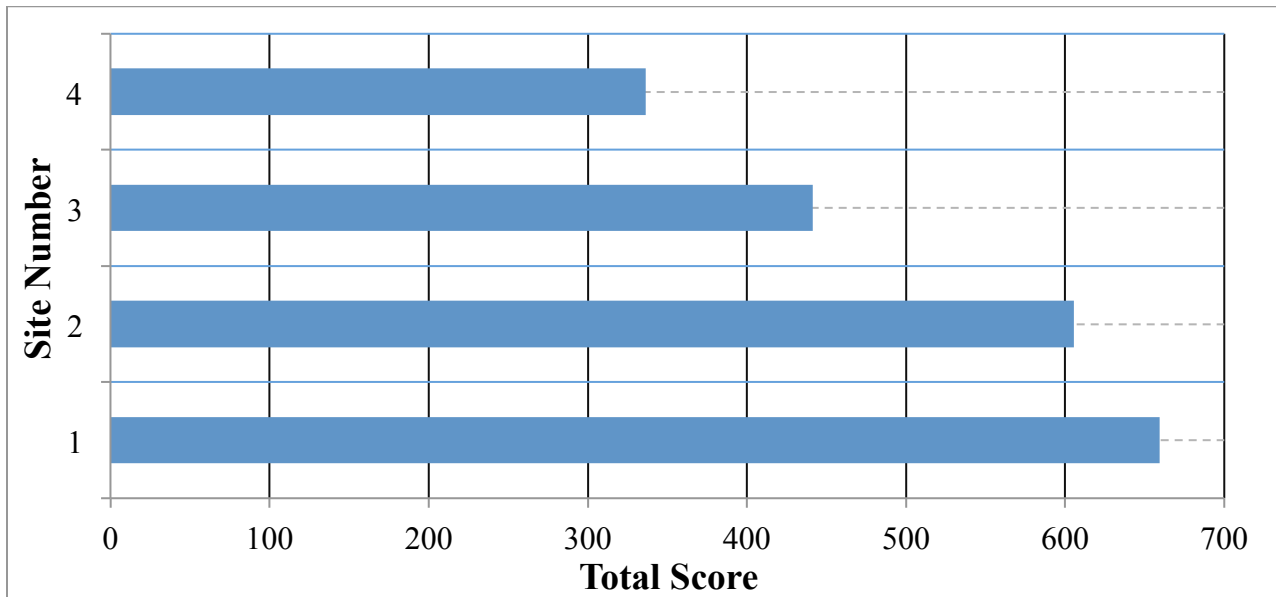
Certainly, any change in weight values or the scoring system will result in different output and may change the decision. For better analysis and decision-making, the dynamic suitability model, which allows modification in criteria's weights, thresholds and scores is available for distribution through RTI's Geospatial Program.

Besides a distance analysis, a suitability model for Upshur is supported by demographic data as well as two additional analyses, which are retail location density and workforce analysis (shown on Table 15 and Map 41 below). The best decision will be made with careful consideration of the suitability analysis as well as the demographic and economic information.

**Table 14: Total score of all surface coal mining sites in Upshur County**

Site No.	Permittee	Permit_ID	Score
1	Jerry Stalnaker Coal Company Inc	S200799	659.5
2	Marion Docks, Inc.	S200892	605.5
3	Nesco, Inc.	S200604	441.5
4	Upshur Property, Inc.	S005780	336.5

**Figure 15: Upshur County’s Suitability Model (Total Score of Each Surface Coal Mining Site)**



**Work Force Analysis**

A work force analysis estimates total employment and unemployment within a certain distance, providing potential labor sources if an investment is made on the site. According to Gary Langer, the average one-way commute time is 26 minutes or 16 miles.<sup>11</sup> It is reasonable to consider unemployment within 15 miles of the site as an upper limit for a potential employer. This data set does not provide a skill set analysis however; therefore employers may not find the labor skills they need. This dataset provides the pool of labor resources from which to choose.

**Table 15: Number of employment and unemployment within radius of 5, 10 and 15 miles from the site**

Rank	Permit_ID	Emp_05	Unemp_05	Emp_10	Unemp_10	Emp_15	Unemp_15
1	S500407	4902	506	7477	775	8345	932
2	S500706	861	87	5551	579	7554	788
3	S501899	3767	338	8052	925	9386	1123
4	S502500	714	128	6617	754	9053	1088

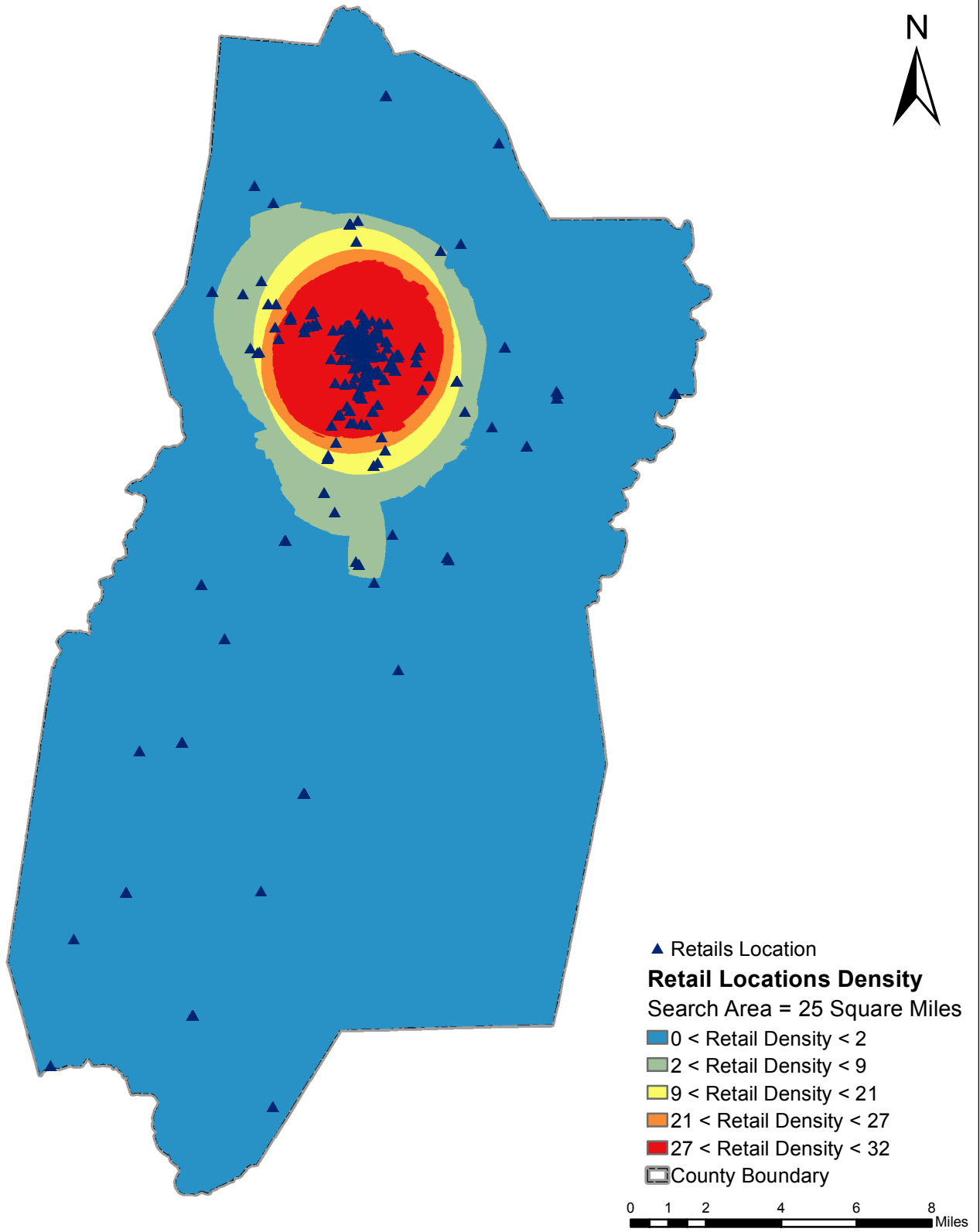
<sup>11</sup> Gary Langer, “Poll: Traffic in the United States,” ABC News Online, February 13, 2005, Accessed March 1, 2013, <http://abcnews.go.com/Technology/Traffic/story?id=485098&page=1>.

### **Retail Location Analysis**

A retail location analysis is a hot spot analysis that depicts a number of retailers within 25 square miles of any certain location in the county (Map 41). The result, as shown on the map, is displayed in blue-to-red color for retail's density from low to high. Normally, the area with a high density of retailers indicates an already developed and populated community, which possibly has the highest opportunity as well as the heaviest competition. The areas with low retail density showcase where population is lowest, but also where competition is lowest and which may provide retail opportunities.

# Retail Location Density

## Upshur County



Source: ESRI 2011

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## **V. Conclusion**

Upshur County's steadily growing population has endured national shocks such as coal industry cost cutting and the recession well. Due to Education and Health Services and Trade, Transportation, and Utilities jobs, wages have been steadily growing in the county, and energy development is being actively pursued. However, these two sectors may not continue to be stable, educational issues persist, and post-mine land use has not been active. This plan could be useful in furthering Upshur's growth despite the small inventory of mine sites.

This plan has identified and displayed the four post-mine sites that are most suitable for development. These sites have the integral tools that researchers have shown can assist in spatial development. Though success is not guaranteed, this overview combined with careful strategic planning can bring about the changes in the trends that are necessary for Upshur County to thrive.

Through a site distance analysis and complete demographic calculation, this plan provides the most comprehensive understanding of the economic state of Upshur County and the potential of its land. By analyzing specific infrastructures and demographics, policymakers can begin attracting investors to post-mine sites, and continue the process of developing the economy. This plan provides strategic information; the choice as to how to utilize this information belongs with the administrators and people of the county.