A Socioeconomic Atlas for

Harpers Ferry National Historical Park and its Region

2001

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by

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Acknowledgments

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About this Atlas

This atlas is one of a series of four pilot atlases produced by the National Park Service Social Science Program. The objective of this project is to demonstrate the feasibility and usefulness of such atlases for units of the National Park System. The other three atlases depict socioeconomic indicators for the regions surrounding Joshua Tree National Park, Mount Rainier National Park, and Wilson's Creek National Battlefield. For more information about the atlas series, contact: Dr. Jean McKendry, National Park Service, Social Science Program, 1849 C Street NW (3127), Washington DC 20240 (jeanm@uidaho.edu).

Preface

Protection of the National Park System requires active and scientifically informed management. If park resources – both natural and cultural – are to be protected for future generations, the NPS must develop efficient ways to monitor the condition and trends of natural and human systems. Such monitoring must provide usable knowledge that managers can apply to the preservation of resources. And the NPS must share this information with surrounding communities, stakeholders and partners, to help them make important choices about their future.

Because of these reasons and more, the NPS has embarked on a significant initiative – the Natural Resource Challenge. This atlas, part of a pilot project, is one component in that effort. It is a tool for park managers, planners, community leaders, and others to use in addressing the challenge of preserving the natural and cultural resources of Harpers Ferry National Historical Park. Part of that challenge involves understanding conditions outside park boundaries – conditions which can have significant impacts on park resources. Systematic study and monitoring of regional conditions involves, to a large degree, investigation of human activities. This atlas focuses on such human activities, characterizing them in terms of standardized measures known as socioeconomic indicators.

The atlas can currently serve as a training tool, as an aid to management and planning, and as a means to facilitate public participation. It can be of long-term benefit by establishing baseline data for monitoring changing conditions and trends in the region. Through these and other potential uses, the atlas supports the critical goal of improving park management through a greater reliance on usable scientific knowledge, and contributes to meeting the Natural Resource Challenge.

Gary E. Machlis
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Introduction

The purpose of this atlas is to provide park managers, planners, community leaders, and others with a better understanding of changing human activities and socioeconomic conditions in the region surrounding Harpers Ferry National Historical Park. Change in human activities and socioeconomic conditions outside a park's boundaries can create complex park management challenges. Information about regional trends and conditions is needed in order to manage and conserve park resources – both natural and cultural – more effectively. This atlas provides such information in a series of maps, complemented by tables, other graphics, and explanatory text.

Maps are effective ways of conveying information. A map can highlight geographical patterns in data by showing the relationship between *what* is happening and *where* it is happening. For example, a map that shows a park's road network and also shows the locations of traffic accidents may indicate that certain sections of park roadway are particularly hazardous. Or a map that plots where park visitors come from might show that the park is popular with residents from a particular part of the region or the nation.

The maps in this atlas combine *contextual* information (such as boundaries, roads, and key towns) with *thematic* information (such as demographic or economic statistics) displayed at the county level. This combination of contextual and thematic information helps the reader observe general trends inherent in the distribution of data. For example, a map that shows the population growth rate for each county in the park region may reveal that all of the highest growth rates are concentrated in counties south of the park.

Each map is designed to allow for easy comparison, so readers can see how conditions and trends in their own counties compare with those in other counties and relate to larger regional patterns. The consistent map design allows readers to make useful comparisons among two or more maps. For example, comparing maps of federal expenditures per person and poverty rates might reveal that federal expenditures tend to be higher in a region's poorer counties.

There are many potential uses for this atlas. For example, park managers can share the atlas with new park staff, regional staff, the media, or policy makers as a way to orient them to the basic facts about the region. Planners can use the atlas to examine emerging trends outside the park and to prioritize actions to mitigate any anticipated adverse impacts on park resources. Local and regional leaders can consult the atlas to develop environmental policies that support park management goals while remaining responsive to local needs. Researchers can use the atlas to design studies that have practical benefit to park and ecosystem management. Additional uses are discussed in the atlas's concluding section, pages 76 - 77. Regardless of how it is used, the atlas can serve as a useful reference tool that adds to the body of usable scientific knowledge about Harpers Ferry National Historical Park and its surrounding region.

Socioeconomic Indicators: Valuable Management Tools

The Relevance of Human Activities to Park Resource Management

The management of park resources always requires attention to human behavior and activities. Protection of a threatened archaeological site can mean educating visitors about the Antiquities Act. Controlling non-native plant species can require close collaboration with park neighbors and volunteers. Preservation of scenic values can depend upon the monitoring of emissions from electrical generation plants several states away.

While there is an on-going and healthy debate about how to address this "human factor" in park management, a consensus has emerged about three basic principles:

- people are part of park ecosystems, and their needs and activities must be considered in management plans;
- park managers should be concerned with short and long-term trends, as well as the local, regional and national consequences of actions; and
- where appropriate, decisions about park resources should be made collaboratively, including federal agencies, local governments, and citizens in the process.

Managing parks in accordance with these principles requires careful planning, for people have many competing needs. Careful planning requires an accurate and objective assessment of current conditions as well as on-going trends. Hence, understanding the social, cultural, and economic characteristics of the park region is crucial for successful park management.

The Value of Socioeconomic Indicators

One approach to understanding social, cultural, and economic conditions and trends is to use *socioeconomic indicators*. Socioeconomic indicators are regularly collected economic or social statistics that describe or predict changes and trends in the general state of society. For example, the consumer price index (CPI) keeps track of changes in the price of a typical group of consumer goods. The CPI is used to monitor inflation, to compare the cost-of-living in one region of the country to another, and to support economic policy-making. Socioeconomic indicators can address historical trends, present conditions, or future projections.

An integrated set of socioeconomic indicators can be effective in presenting the "basic facts" about the people of a region. Such basic facts are important to park management, and can be used in many ways: assessing the potential impact of government policies, developing sound resource management strategies, designing effective interpretive programs, increasing public involvement in the planning process, and so forth. Like measures of water quality or wildlife populations, socioeconomic indicators enable managers and citizens to make scientifically informed decisions concerning public resources.

The Integrated Set of Indicators

The indicators in this atlas are not simply a collection of various statistics displayed in maps, but an integrated set of indicators organized around broad areas of human activity that are of particular relevance to park management. The selection of a broad range of relevant indicators is important because the dynamics of human interaction on a regional scale are complex. For example, the growth of a new industry can influence a rise in immigration, which in turn can influence other human activities such as housing development. While industry, immigration, and housing are categorically different indicators, each one could be important for a park manager trying to anticipate growth issues that might impact park visitation or ecological systems.

The integrated set of indicators displayed in this atlas encompasses six general categories:

- *General population* indicators measure how many people live in a given area, where those people are concentrated, their ages, family size, patterns of migration, and so forth. General population indicators provide a profile of the people who are neighbors to the park and potential partners in park management.

- *Economy and commerce* indicators measure the flow and distribution of money, materials, and labor. Economy and commerce indicators provide an overview of the interdependent economic relationships among people, businesses, industries, and government with the park region.

- *Social and cultural* indicators measure aspects of personal and group identity such as cultural origin, political and religious beliefs, health, and language. Social and cultural indicators provide insights into the varying perceptions and expectations that people bring with them when they go to their place of work, participate in a public meeting, or visit a park interpretive site.

- *Recreation and tourism* indicators measure activities specifically related to the provision of accommodations, entertainment, and personal services. Recreation and tourism indicators provide a way to analyze the economic role that travelers, vacationers, and other recreationists play in the region surrounding the park, which is itself closely linked to the recreation/tourism sector.

- *Administration and government* indicators measure the structure, resources, and actions of government organizations. Administration and government indicators provide an orientation to the role of government – local, state, and federal – in the park region.

- *Land use* indicators measure the interactions between people and terrestrial resources such as land, water supply, and vegetation. Land use indicators provide a way to gauge the impact of human activities such as farming, forestry, and urban development upon ecosystems within the park region.

Selecting Specific Indicators

Drawing from the six general categories of socioeconomic indicators described above, a menu of 85 socioeconomic indicators was developed. Each indicator was determined to be readily available and mappable at the county level. From this menu, 17 *core indicators* were selected that would be common to all atlases published in this pilot series. The core indicators provide information relavant to all park managers. Incorporating these core indicators throughout the series of atlases enables park managers to make comparisons among parks in different regions of the country. Harpers Ferry NHP staff chose additional indicators from the menu described above. Park staff selected these indicators to customize the atlas so that it would include information specific to their particular management needs. Figure 1 shows the six general categories and the indicators included in this atlas.

The maps in this atlas are based on county-level data wherever possible. County-level data have several advantages. Good quality data are available at this scale, consistently collected at regular intervals, and comparable across all U.S. counties. Also, counties are stable geographic units for monitoring trends, as little change in county boundaries occurs over time. Finally, as administrative and political units, counties significantly influence environmental change, and can be important partners in park management.

Technical Notes

Appendix 1 provides the data sources for the indicators presented in this atlas. Appendix 2 provides technical information on the design of the maps. Appendix 3 includes endnotes and text that provide additional information on the measurement of selected indicators.

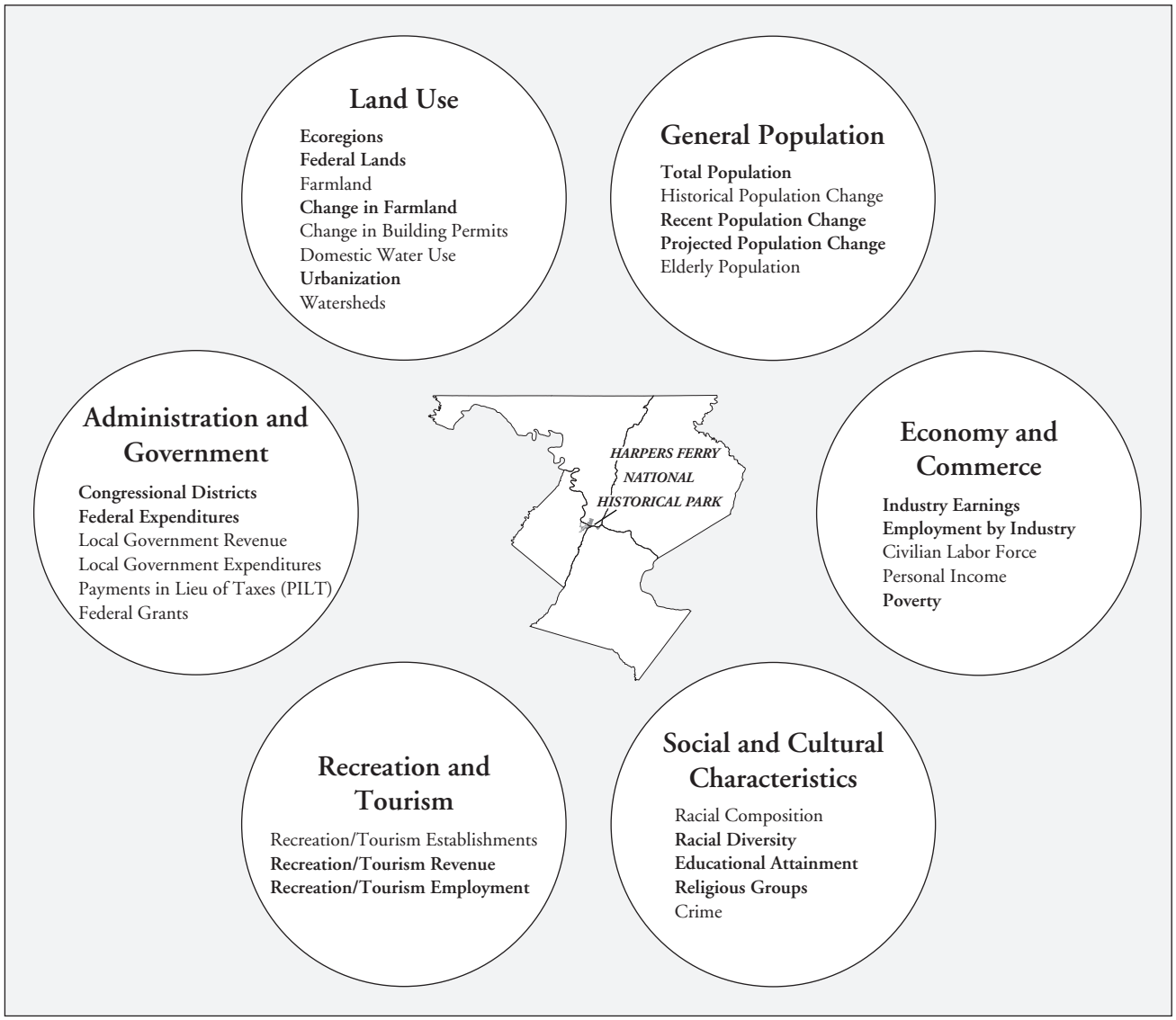


Figure 1. Indicators Included in this Atlas **core indicator** additional indicator

The Region

In selecting the boundaries of the region of interest covered by this atlas, Harpers Ferry NHP staff were asked to define the geographic area that has the most significant impact on the park's management. Because the atlas relies on county-level socioeconomic data, the region of interest was restricted to entire counties, rather than parts of counties. The region selected includes Jefferson County, West Virginia; Loudoun County, Virginia; and two Maryland counties, Frederick and Washington. The map on the facing page depicts the region in its larger context.

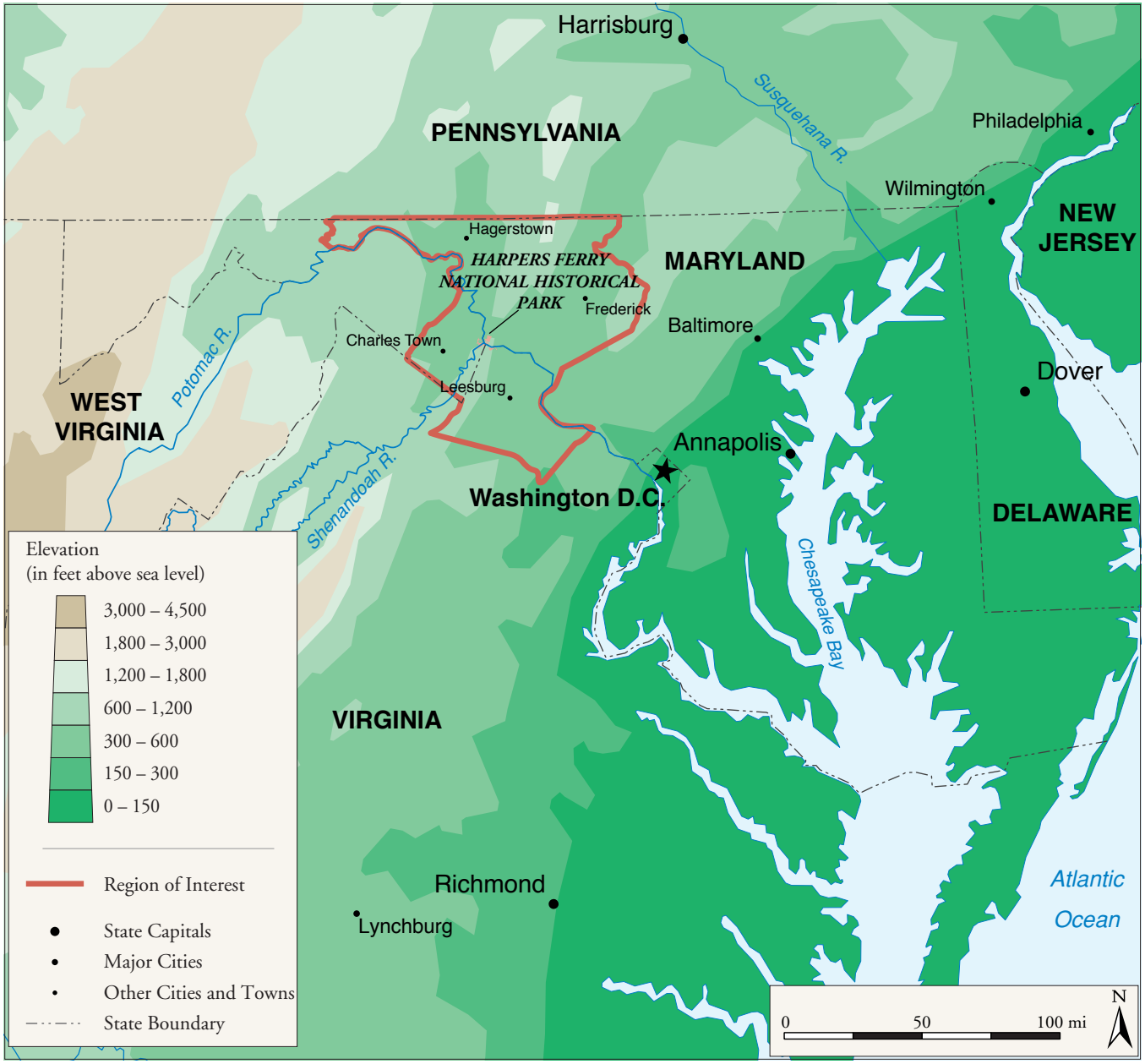
Harpers Ferry National Historical Park is located in West Virginia, Maryland, and Virginia, at the confluence of the Potomac and Shenandoah rivers. The park is 67 miles west of Baltimore, MD and 68 miles northwest of Washington, DC. The park region has a temperate climate characteristic of the Mid-Atlantic, with northern and western areas experiencing slightly lower temperatures and higher snowfall on average. The region is notable for its rich history. From the early days of European settlement, the Potomac served as an important transportation corridor into the mountains, and the fertile valley west of the Blue Ridge and South Mountain was an important migration route for early settlers. The region's strategic location between North and South made it the scene of intense conflict during the Civil War.

Today, the Harpers Ferry NHP region is characterized by great diversity in its landscape. As one follows the Potomac River downstream through the region, the farmland and wooded rolling hills of western Washington County open into the broad valley which includes Hagerstown and Charles Town. This part of the region, long important for agricultural production, is now growing steadily as part of the I-81 and I-70 transportation corridors, as a location for a variety of light manufacturing and service industries, and as a bedroom community for the Washington, DC metropolitan area.

At Harpers Ferry, the Potomac passes through the Blue Ridge and into the Piedmont region containing Frederick and Loudoun counties. Like the region's two western counties, these counties also have land devoted to pasture or crop cultivation, but they have experienced rapid growth as development pushes west and north from Washington, DC. Development is more dense in eastern Loudoun and in southern Frederick counties. Civic attention in these growing areas often focuses on issues such as road construction and farmland preservation.

In addition to Harpers Ferry NHP, the broader region contains all or part of several national park units, including Antietam NB, Catoctin Mountain Park, Chesapeake and Ohio Canal NHP, Monocacy NB, and Potomac Heritage National Scenic Trail.

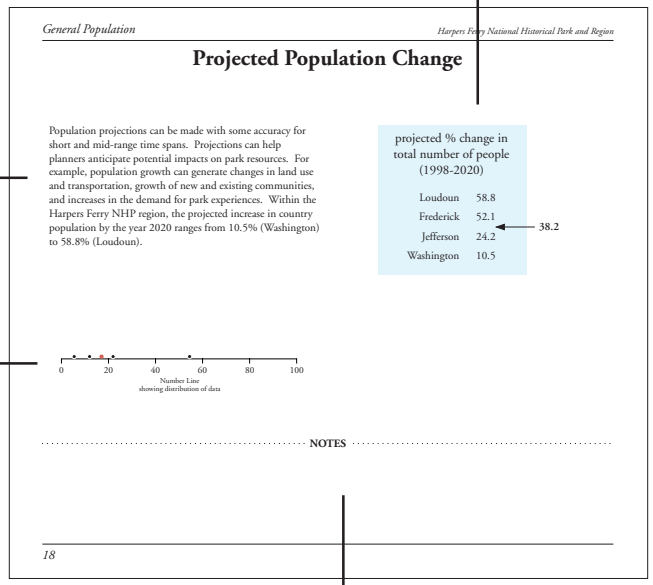
Harpers Ferry National Historical Park and its Region

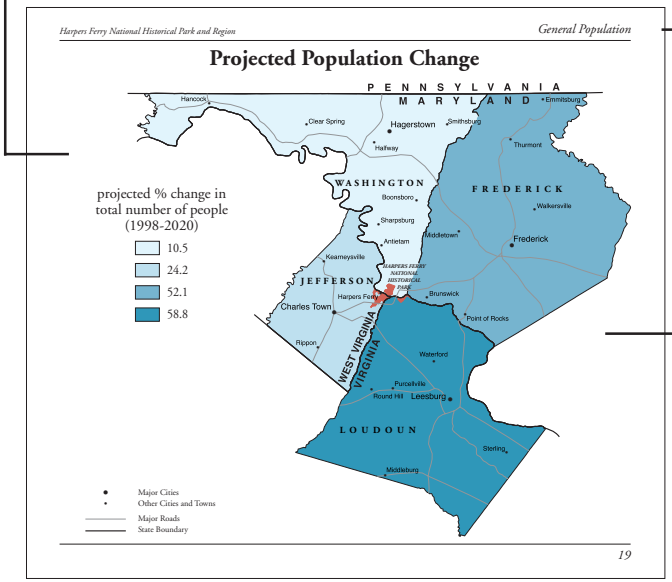


Using the Socioeconomic Indicators and Maps

The socioeconomic indicators for the Harpers Ferry National Historical Park region of interest are presented in a series of maps. The best available county-level data are presented for each indicator. The following information is provided for each indicator:

- a brief description of the socioeconomic indicator and an observation about the spatial variation in the data as displayed on the map.
- a table that shows the data and relative rank for each county. The median value is highlighted in **bold**. The table allows the reader to look up and compare specific indicator values for each county.
- a map legend describing how the indicator is measured, the year that the data were gathered, and the range of values for each quartile grouping.
- the name of the general category to which this particular indicator belongs (such as general population or land use). The same base color is used for all indicators in the same general category.





- a number line that shows the distribution of values for the indicator, useful in understanding patterns in the data. The median value is represented by a **red** dot.
- a section for notes. Atlas users can add their own observations about each indicator, and note questions for further analysis.
- a map that displays general trends inherent in the data. For most indicators, counties are grouped into four classes that correspond to four sub-ranges of data values. These groups are called *quartiles*. The highest-ranked quartile receives the darkest shading. For more information on quartile classification, see Appendix 2, page 82.

The Socioeconomic Indicators

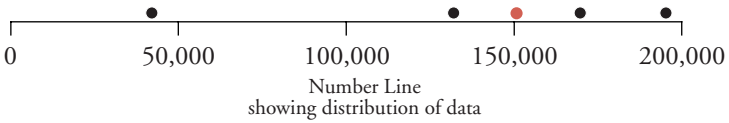
Total Population

Population size is one of the most important influences on the character of human activities in a place, and a key influence on resource use. People bring labor, knowledge, and economic activity to a place. At the same time, they generate demand for natural resources, goods and services ranging from food to recreational opportunities. Within the Harpers Ferry NHP region, county population (2000) ranges from 42,190 (Jefferson) to 195,277 (Frederick).

total number of people (2000)

Frederick	195,277
Loudoun	169,599
Washington	131,923
Jefferson	42,190

150,761



Number Line
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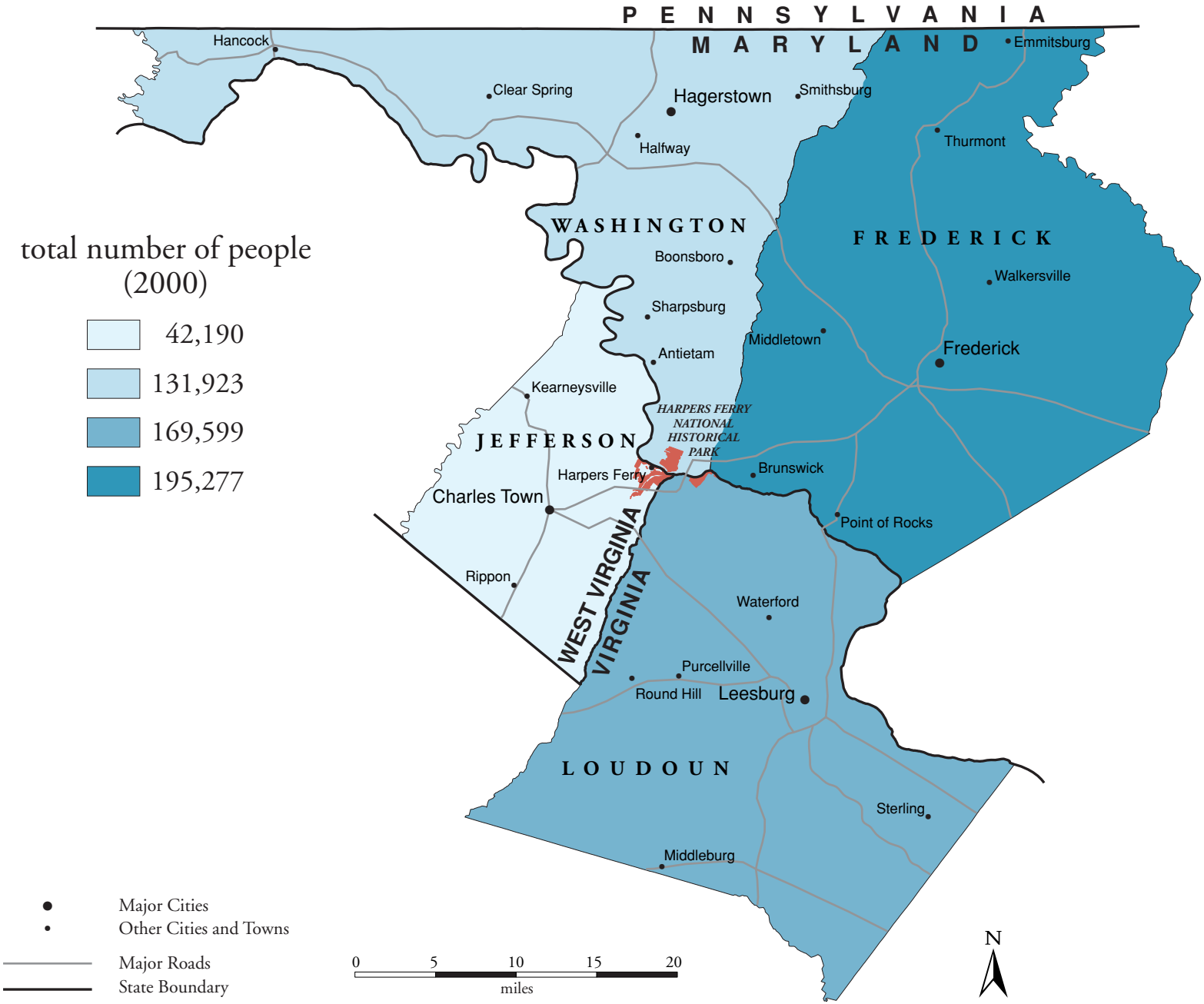
Total Population



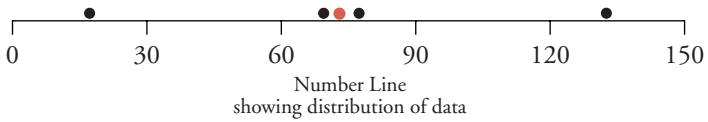
Historical Population Change

Population change is due to birth, deaths, and migration. Trends in historical population change (1970-1990) provide a context from which to view recent population change (1990-2000). The direction and rate of population change are important socioeconomic trends. For example, population growth increases the size of the economy and can generate changes in land use that affect natural ecosystems. Within the Harpers Ferry NHP region, county growth rates (1970-1990) ranged from 16.9% (Washington) to 131.8% (Loudoun).

% change in total number of people (1970-1990)

Loudoun	131.8
Frederick	76.9
Jefferson	68.8
Washington	16.9

72.9



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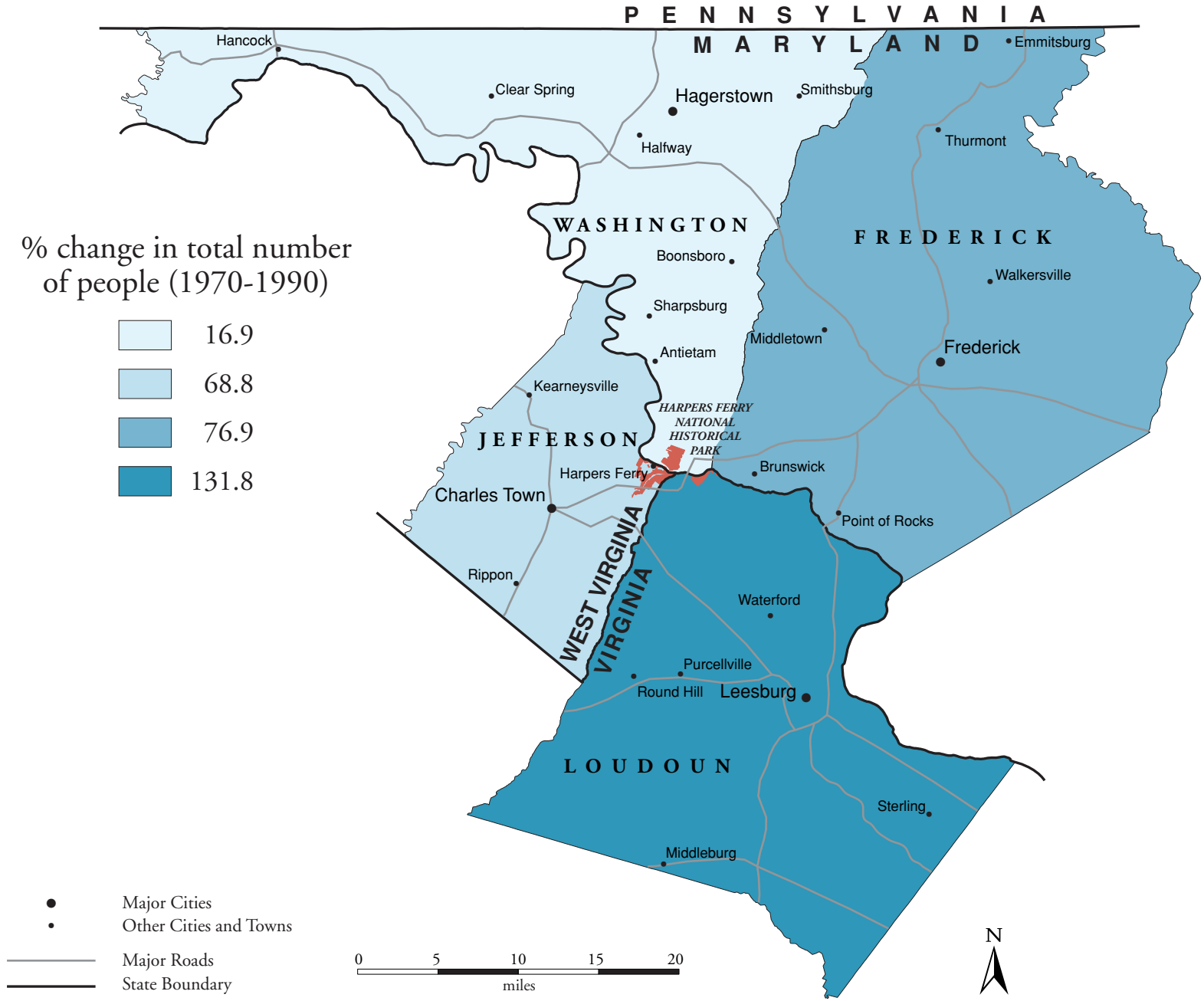
Historical Population Change



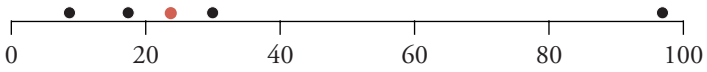
Recent Population Change

Measuring recent population change provides an indication of the extent to which population change is influencing current local or regional priorities. For example, population growth changes the tax base, adds new voters, and can increase demand for services ranging from schools to transportation to outdoor recreation. Within the Harpers Ferry NHP region, the recent increase in county population (1990-2000) ranges from 8.7% (Washington) to 96.9% (Loudoun).

% change in total number of people (1990-2000)

Loudoun	96.9
Frederick	30.0
Jefferson	17.4
Washington	8.7

← **23.7**



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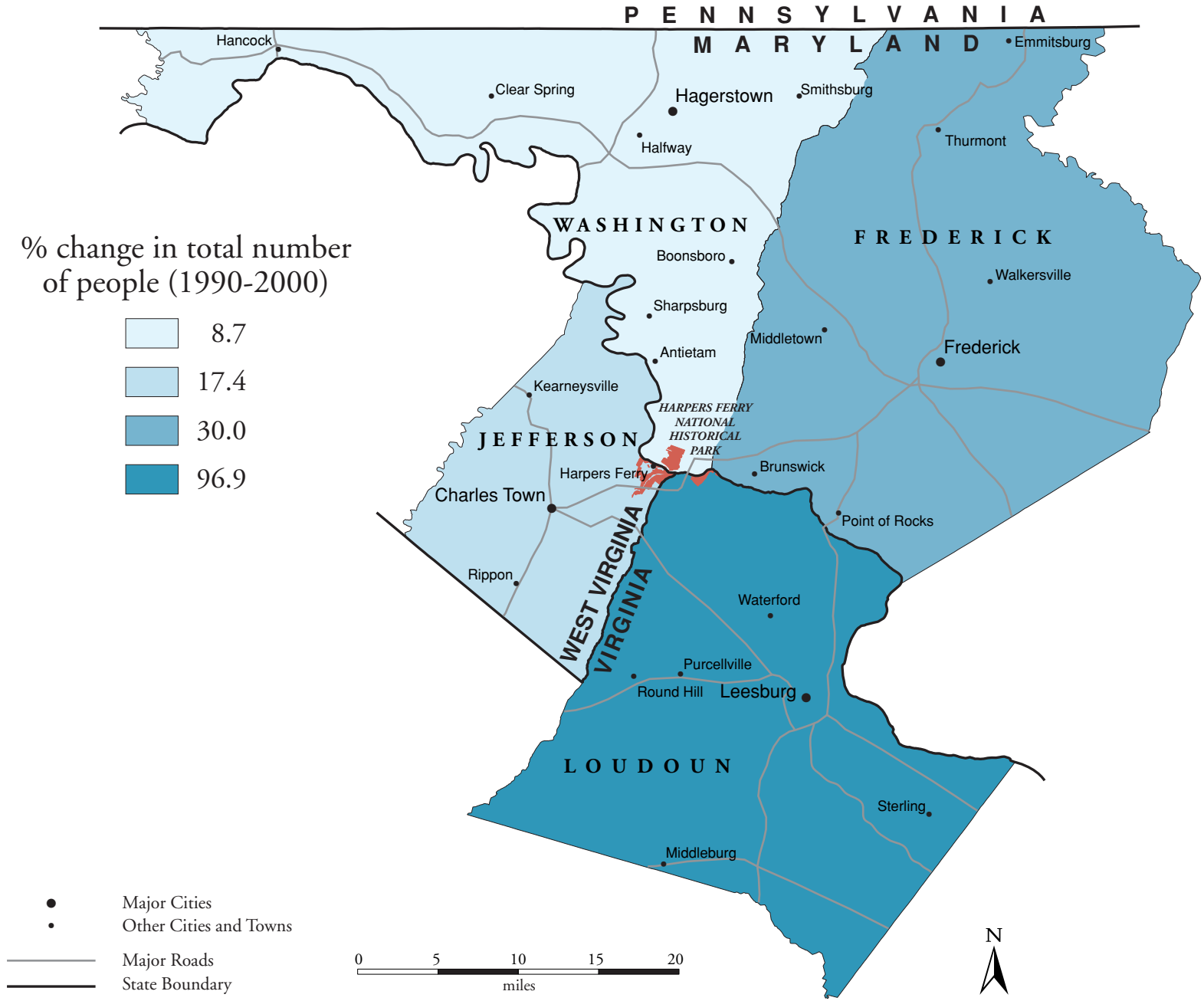
Recent Population Change



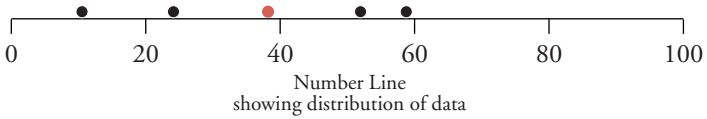
Projected Population Change

Population projections can be made with some accuracy for short and mid-range time spans. Projections can help planners anticipate potential impacts on park resources. For example, population growth can generate changes in land use and transportation, growth of new and existing communities, and increases in the demand for park experiences. Within the Harpers Ferry NHP region, the projected increase in county population by the year 2020 ranges from 10.5% (Washington) to 58.8% (Loudoun).

projected % change in total number of people (1998-2020)

Loudoun	58.8
Frederick	52.1
Jefferson	24.2
Washington	10.5

38.2



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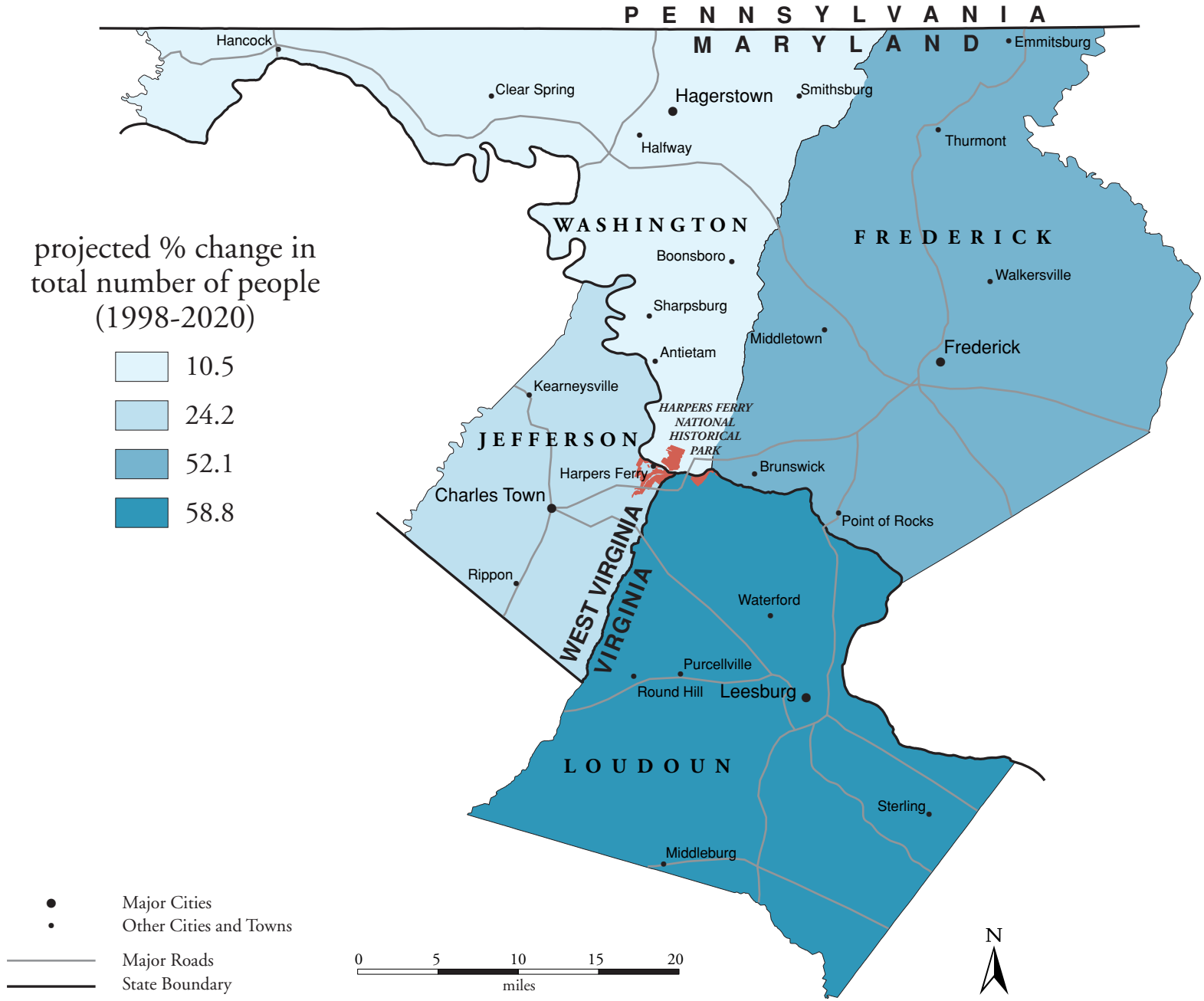
Projected Population Change



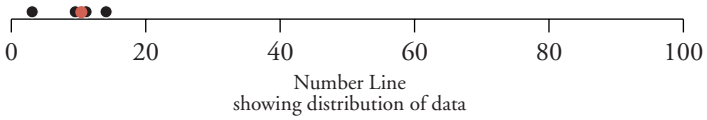
Elderly Population

The size of a county's elderly population is measured as the percentage of its residents who are 65 years old and over. A variety of factors can lead to increases in the population of elderly residents, including increased longevity due to changes in health care, out-migration by younger people for employment or education, or in-migration by retirees. In counties with a higher percentage of older people, there may be a higher demand for health care and recreational activities more suited to the elderly. There may also be a net inflow of dollars into the local economy in the form of medical, retirement, and disability payments. Aspects of civic life ranging from volunteerism to political participation may also be influenced by the size of the elderly population. The needs and interests of the regional elderly population can influence park management in many ways, including design of facilities, development of interpretive programs, recruitment of volunteers, and visitor use schedules and preferences. Within the Harpers Ferry NHP region, the percentage of county residents 65 years old and over (2000) ranges from 3.2% (Loudoun) to 14.2% (Washington).

% total population ≥ 65 years old (2000)

Washington	14.2
Jefferson	11.2
Frederick	9.6
Loudoun	3.2

10.4



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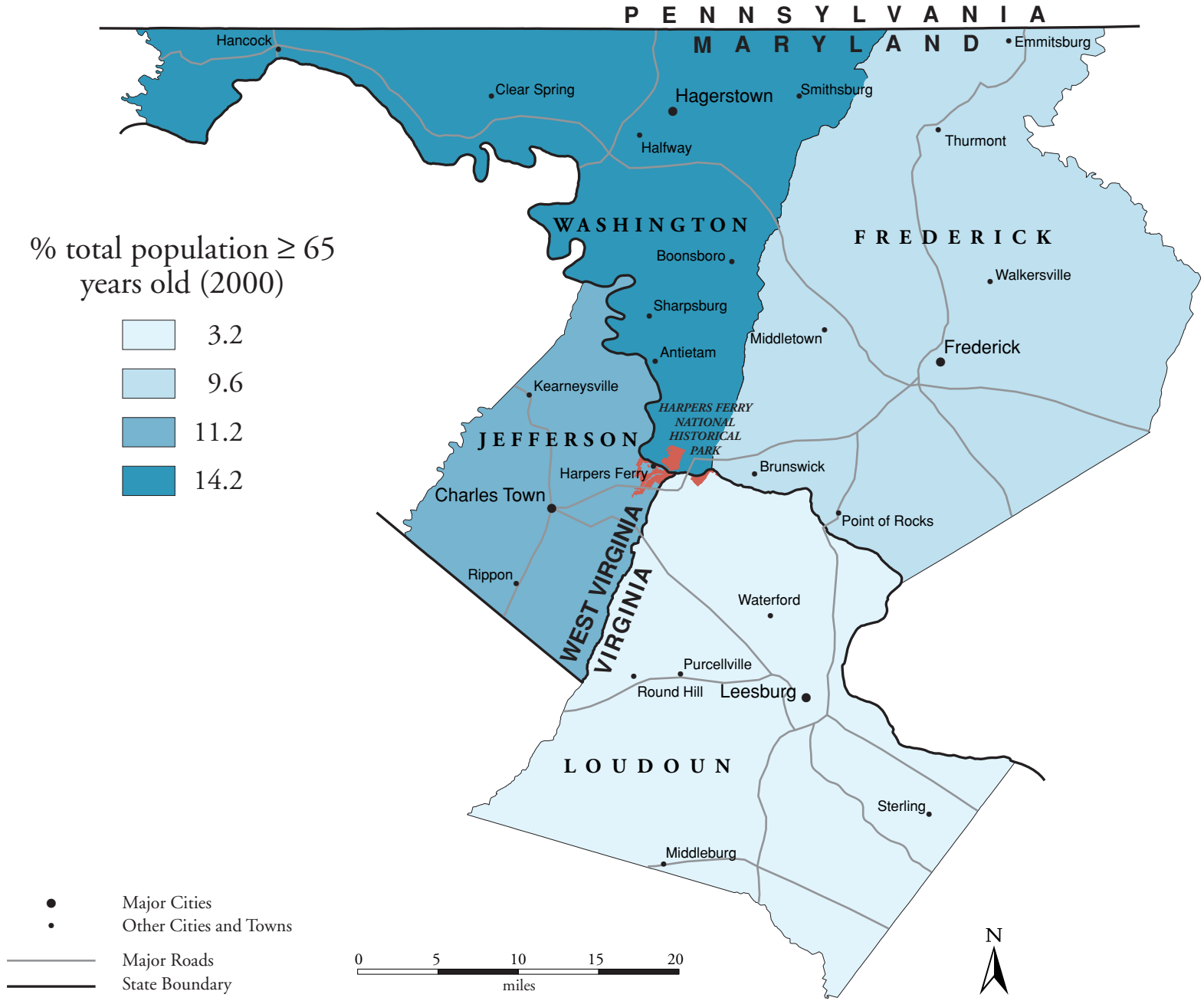
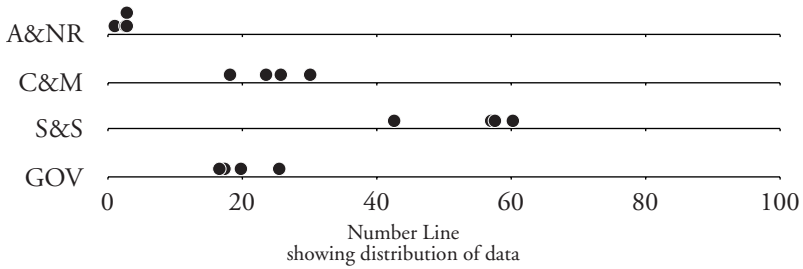
Elderly Population



Industry Earnings

Industry earnings are indicative of the overall size of a local economy as well as the relative importance of each major industrial sector within that economy. The diversity of economic activities in the region presents an array of challenges to park management. For example, relatively mobile industries such as light manufacturing or financial services may be concerned with land costs and tax rates, whereas natural resource dependent industries such as farming or mining may be concerned with land use regulations and other environmental policies. Within the Harpers Ferry NHP region, the leading sector of earnings in each county (1996) is sales/services. The second-ranking sector is construction/manufacturing in each county except Loudoun, where government ranks slightly higher.[1]



% total earnings by industrial category (1996)

	A&NR	C&M	S&S	GOV
Frederick	3	24	57	17
Jefferson	2	30	42	25
Loudoun	3	18	60	20
Washington	1	26	57	16

A&NR = Agriculture and Natural Resources
C&M = Construction and Manufacturing
S&S = Sales and Services
GOV = Government

Percentages may not add to one hundred due to rounding.

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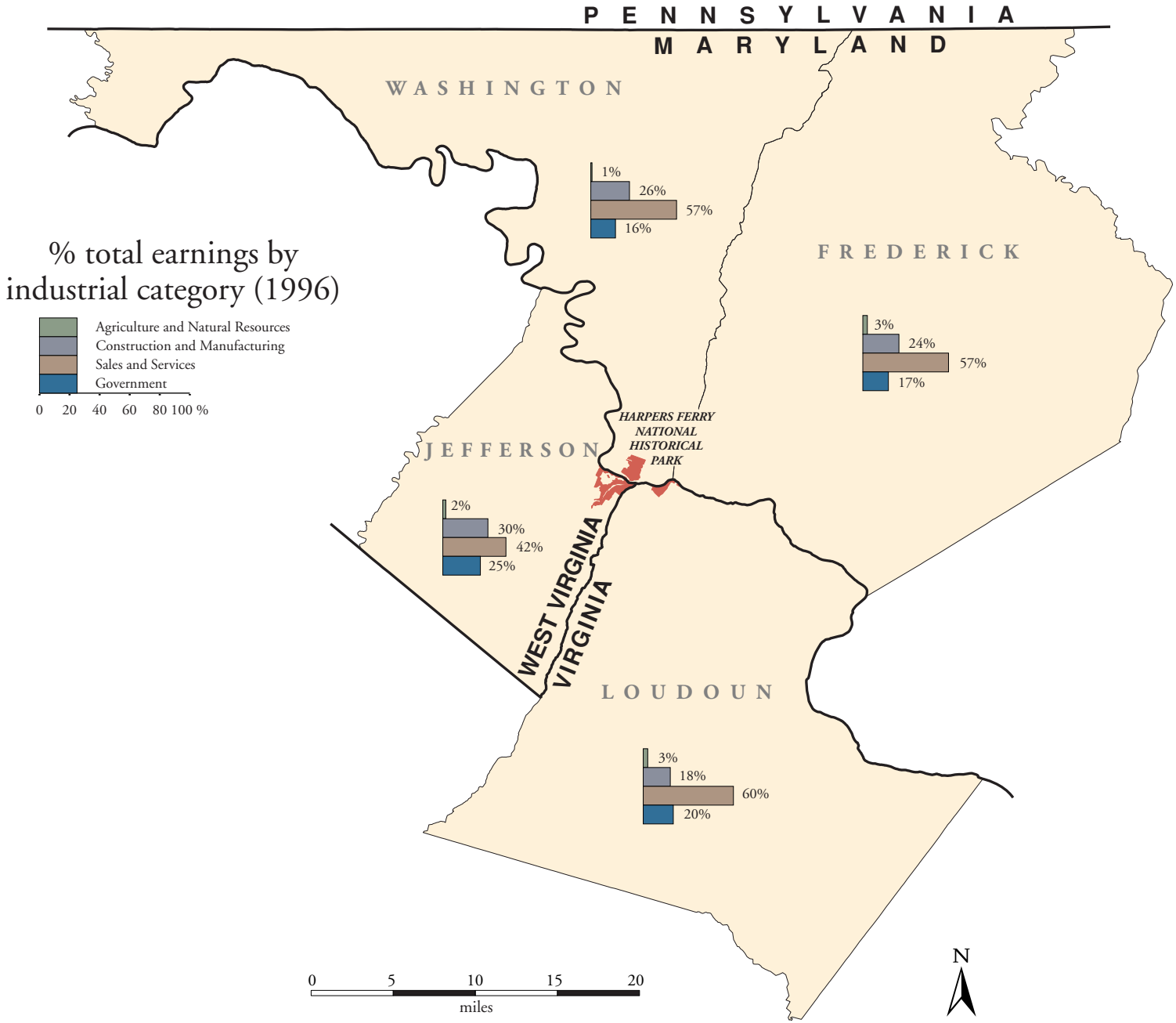
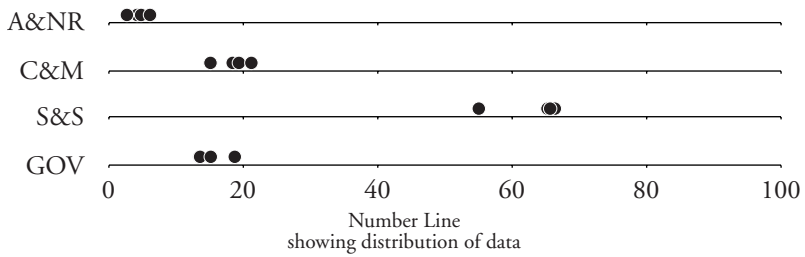
Industry Earnings



Employment by Industry

One indicator of how a county's job market is structured is the percentage of workers employed in each of the four major industrial sectors. This distribution of employment is indicative of the kinds of skills, knowledge, and concerns that are most prevalent among workers. Occupational patterns can influence people's priorities and actions with regard to parks and resource protection. For example, construction workers might welcome the prospect of rapid growth, whereas government workers such as teachers and police might worry that rapid growth would stress existing government resources. Within the Harpers Ferry NHP region, the leading sector of employment in every county (1996) is sales/services. The second-ranking sector is construction/manufacturing in each county except Loudoun, where government ranks slightly higher.[2]



% employment by industrial category (1996)

	A&NR	C&M	S&S	GOV
Frederick	4	18	64	13
Jefferson	6	21	54	19
Loudoun	5	15	66	15
Washington	2	19	65	14

A&NR = Agriculture and Natural Resources
C&M = Construction and Manufacturing
S&S = Sales and Services
GOV = Government

Percentages may not add to one hundred due to rounding.

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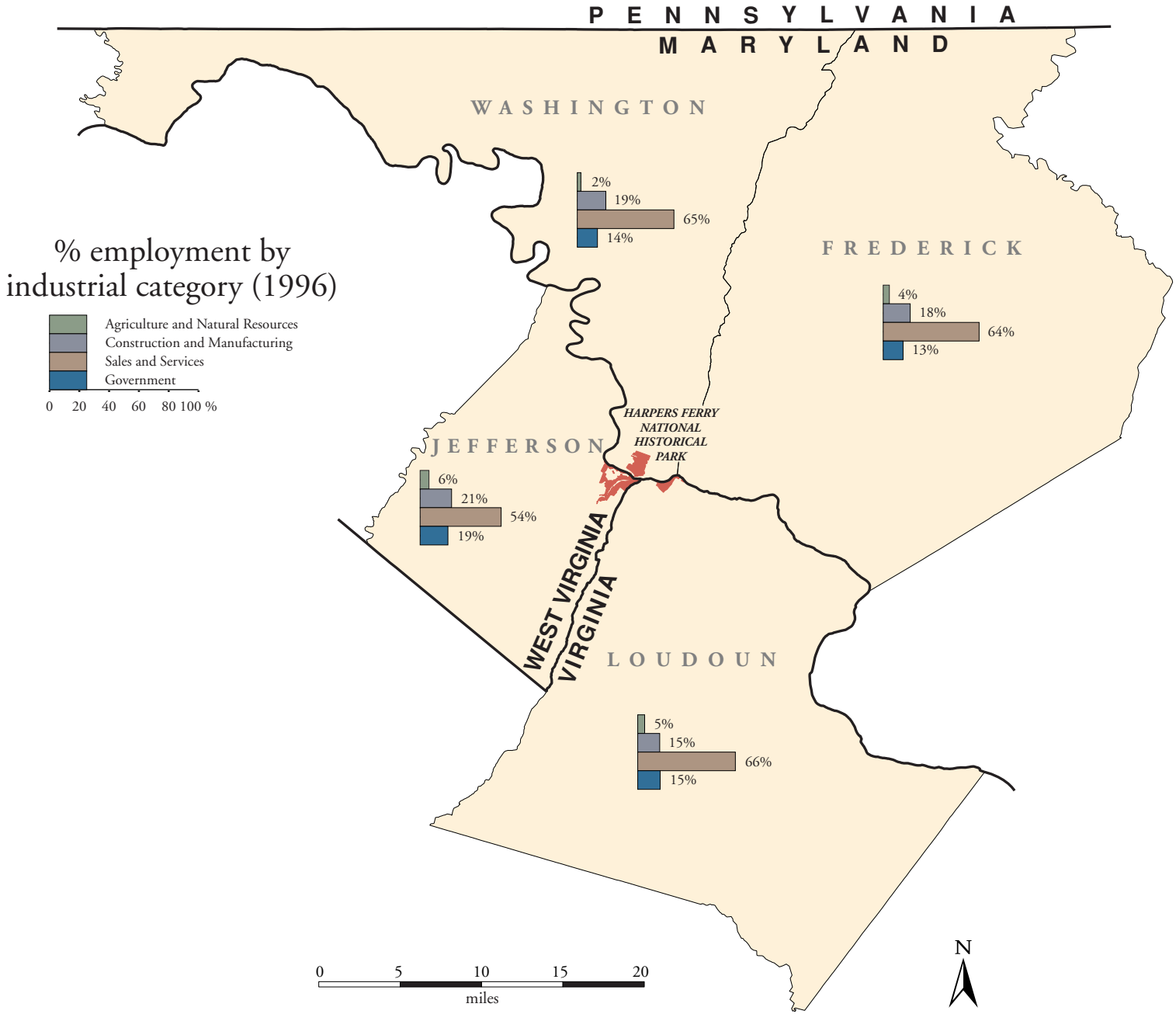
Employment by Industry



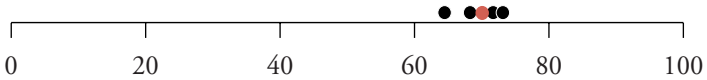
Civilian Labor Force

The size of the civilian labor force is measured as the percentage of all persons 16 years old and over, who are employed, or unemployed and looking for work. A large civilian labor force is an indication of a relatively active economy, in which financial need and employment opportunities are drawing individuals such as retirees and homemakers into the workplace. A smaller civilian labor force may indicate a slow economy, be correlated with a high percentage of retirees or young adults in the overall population, or be linked to families where one adult works outside the home. Within the Harpers Ferry NHP region, the percentage of the civilian labor force (1996) ranges from 64.5% (Jefferson) to 73.2% (Frederick).[3]

% total population ≥ 16 years old in the civilian labor force (1996)

Frederick	73.2
Loudoun	71.7
Washington	68.3
Jefferson	64.5

70.0



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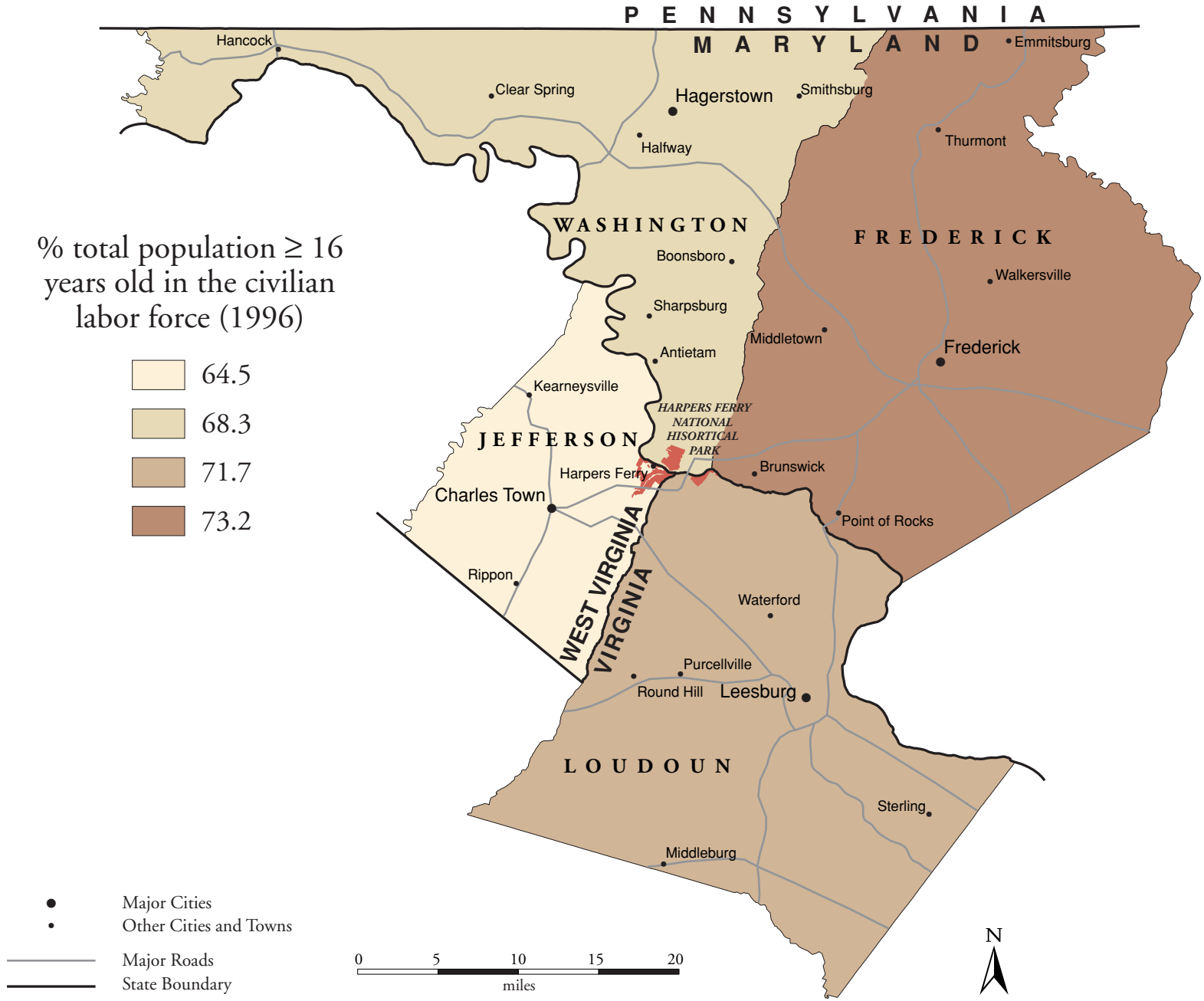
Civilian Labor Force



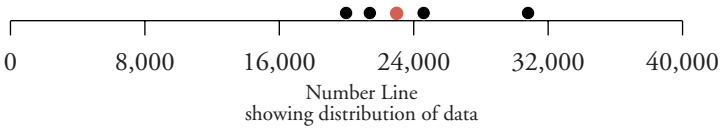
Personal Income

Personal income provides an indication of the relative affluence of counties in the region. Variations in average income per person across the region can influence the manner in which residents use tools, such as grassroots organizing, fundraising, legal action, or election cycles, to make local concerns a government priority. Park management and resource protection often requires that local relationships be established that transcend differences in wealth and affluence. Within the Harpers Ferry NHP region, average income per person (1996) ranges from $19,918 (Washington) to $30,807 (Loudoun).[4]

average personal income per capita ($) (1996)

Loudoun	30,807
Frederick	24,582
Jefferson	21,402
Washington	19,918

22,992



Number Line
showing distribution of data

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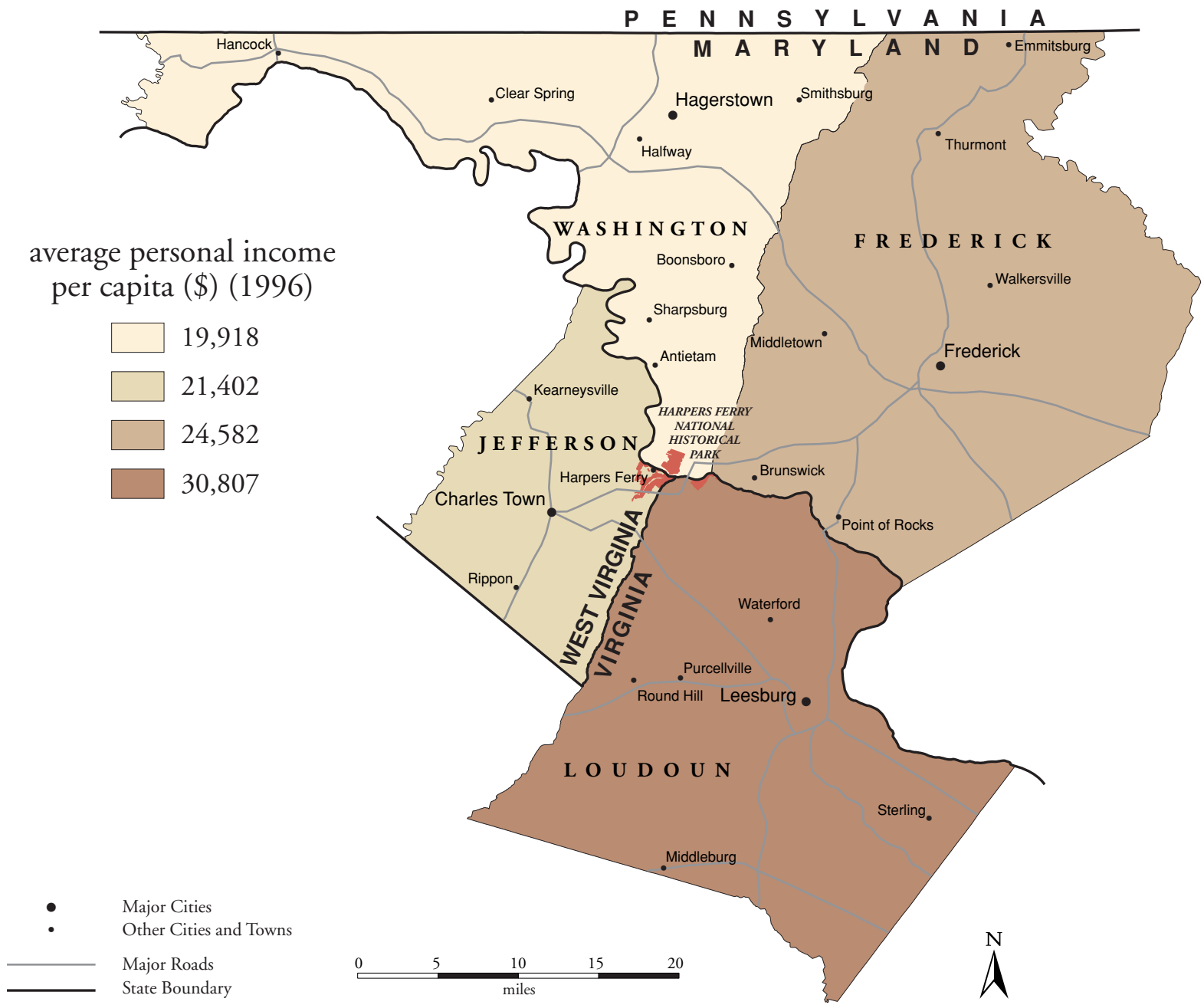
Personal Income



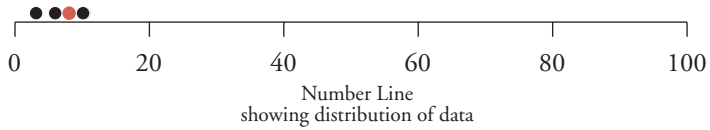
Poverty

Poverty is officially defined as the condition of living in a household with income below the federally-determined poverty threshold ($16,400 in 1997). The extent of poverty can be measured as the percentage of the total population living below that threshold. Those living in poverty can face such difficulties as finding adequate housing and health care, getting enough food, and reaching job sites and government services, including parks. The level of poverty in the park region necessarily becomes significant to park management decisions and priorities. Within the Harpers Ferry NHP region, the level of poverty (1997) ranges from 3.9% (Loudoun) to 10.1% (Jefferson).[5]

% total population in poverty (1997)

Jefferson	10.1
Washington	10.0
Frederick	5.8
Loudoun	3.9

7.9



Number Line
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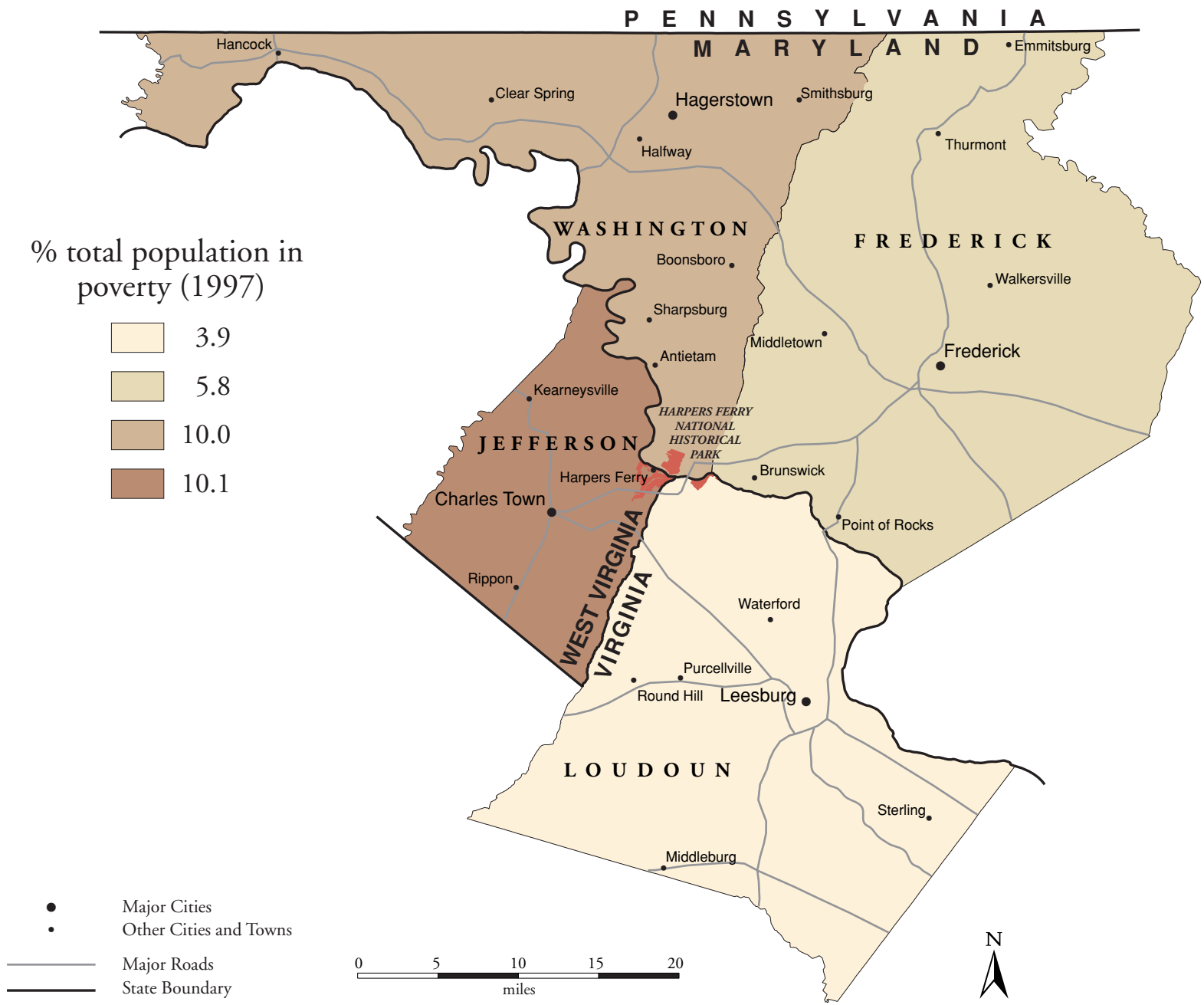
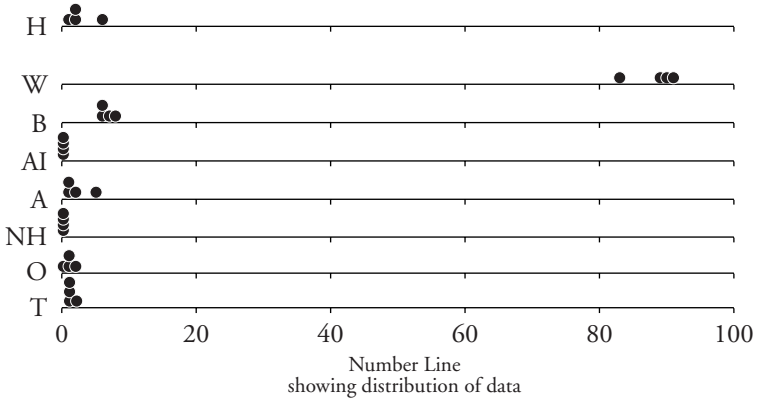
Poverty


PENNSYLVANIA
MARYLAND
Hancock
Clear Spring
Hagerstown
Smithsburg
Emmitsburg
Halfway
Thurmont
WASHINGTON
FREDERICK
Boonsboro
Walkersville
Sharpsburg
Middletown
Frederick
Antietam
Kearneysville
HARPERS FERRY NATIONAL HISTORICAL PARK
JEFFERSON
Harpers Ferry
Brunswick
Charles Town
Point of Rocks
WEST VIRGINIA
Rippon
Waterford
Purcellville
Round Hill
Leesburg
LOUDOUN
Sterling
Middleburg
% total population in poverty (1997)
3.9
5.8
10.0
10.1
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 5 10 15 20
miles
N

Racial Composition

Race/ethnicity indicators express the size of each race/ethnicity group in a given geographic area. Racial composition can be indicated in broad terms by measuring the relative size of each of the major racial groups and separate ethnicity category as classified by the U.S. Census Bureau. In a diverse society, racial composition can have many impacts. Within the Harpers Ferry NHP region (2000), whites constitute the largest racial group in all of the four counties. Loudoun county has the largest percentage of persons of Hispanic or Latino origin.[6]



% total population in each of the following racial/ethnic categories (2000)

	H	W	B	AI	A	NH	O	T
Frederick	2	89	6	0	2	0	1	1
Jefferson	2	91	6	0	1	0	1	1
Loudoun	6	83	7	0	5	0	2	2
Washington	1	90	8	0	1	0	0	1

H = Hispanic or Latino Origin
W = White
B = Black or African American
AI = American Indian or Alaska Native
A = Asian
NH = Native Hawaiian or Other Pacific Islander
O = Some Other Race
T = Two or More Races

Percentages for race may not add to one hundred due to rounding.

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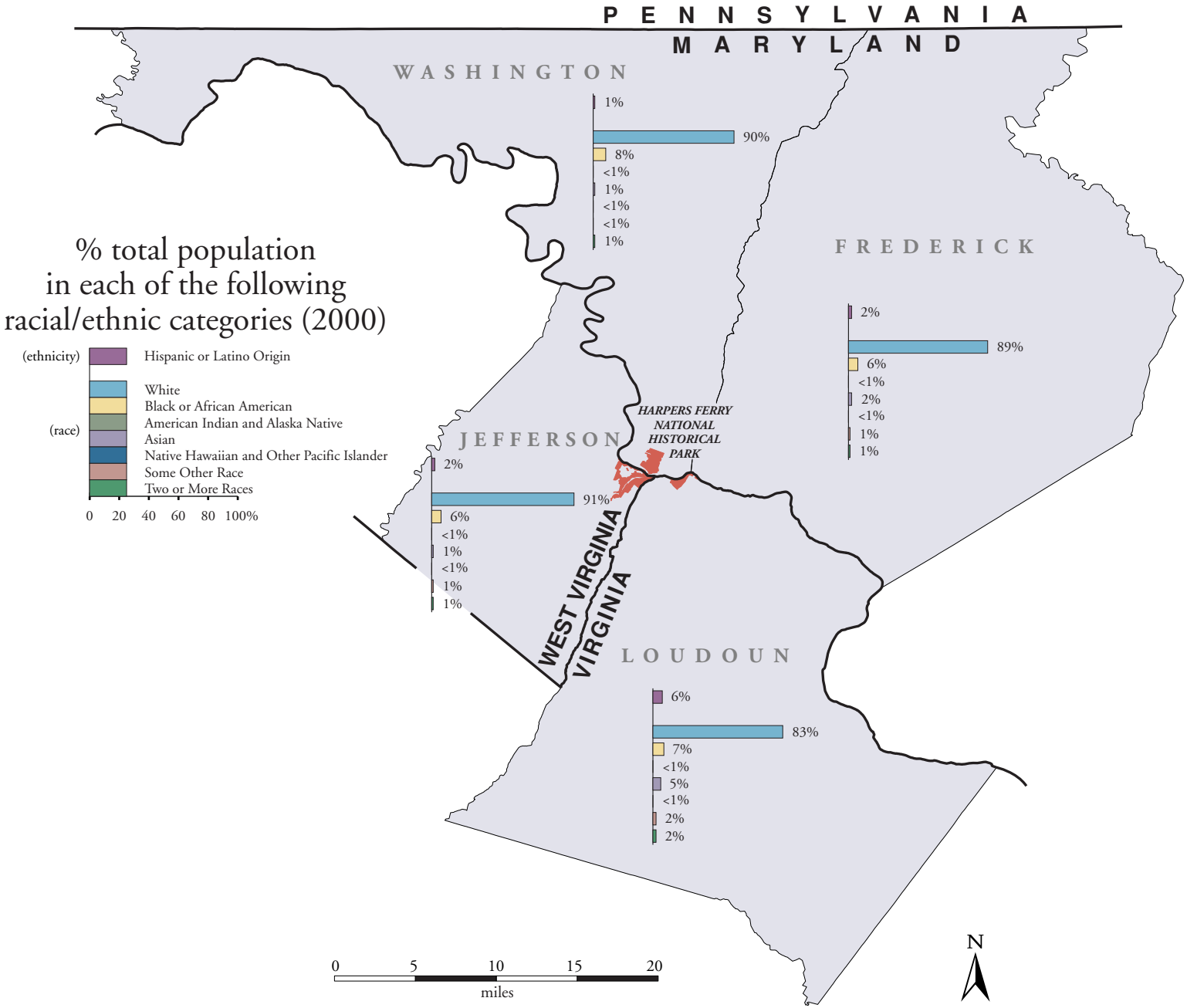
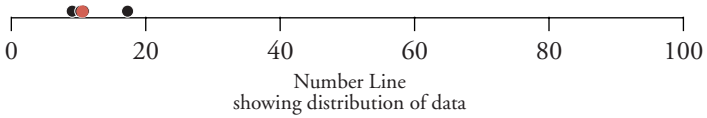
Racial Composition



Racial Diversity

Racial diversity is measured as the percentage of the population who identify themselves as belonging to minorities. In the current U.S. context, "minority" is defined as non-white (Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Some Other Race, and Two or More Races). Interactions among people are often influenced by racial identity. Hence, it makes sense for institutions ranging from retailers to police to parks to consider regional racial diversity when recruiting and training staff, when designing public information and educational materials, and when soliciting public involvement in decision-making. Within the Harpers Ferry NHP region, the percentage of minorities (2000) ranges from 9% (Jefferson) to 17.2% (Loudoun).[7]



Number Line
showing distribution of data

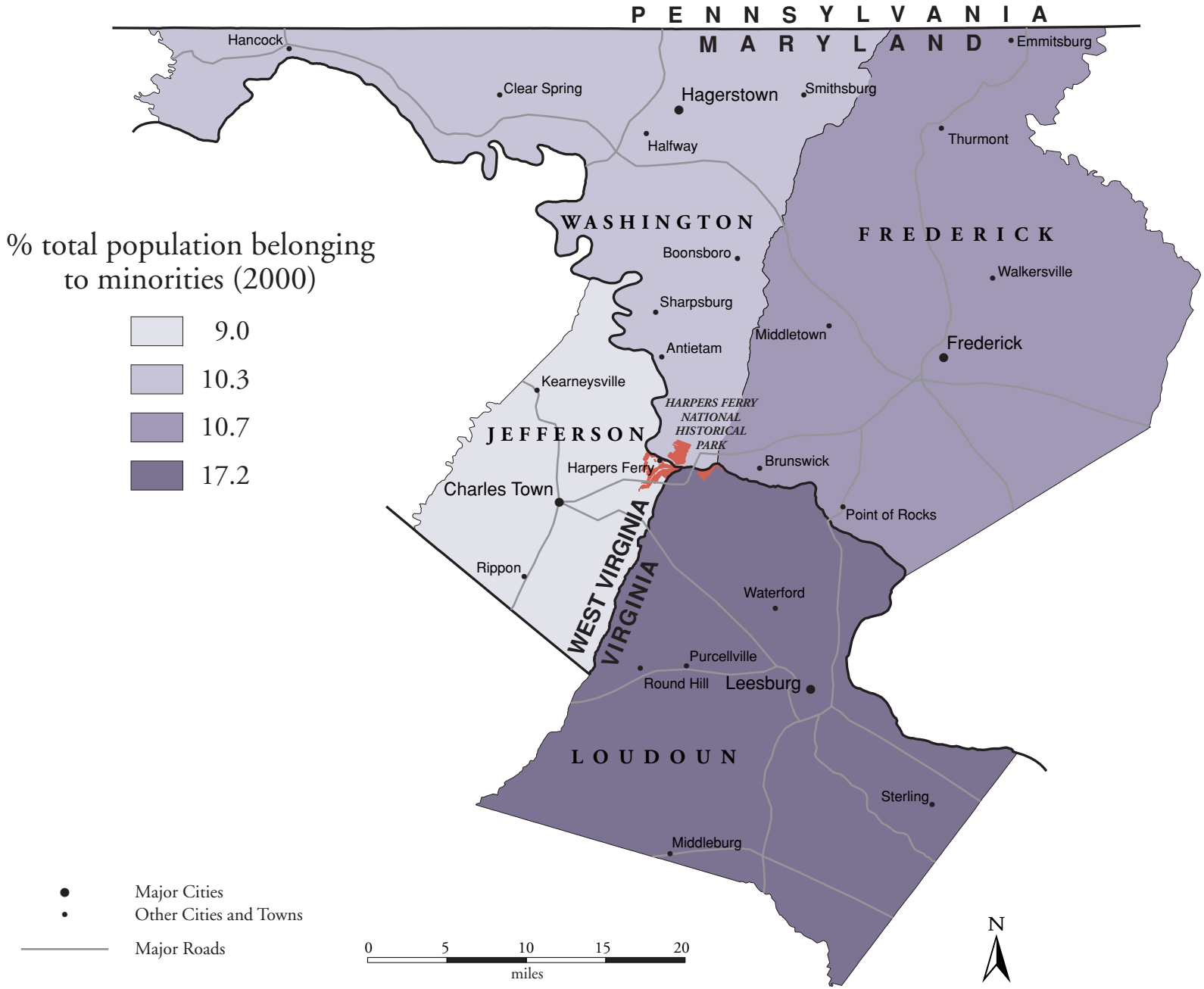
% total population belonging to minorities (2000)

Loudoun	17.2
Frederick	10.7
Washington	10.3
Jefferson	9.0

10.5

NOTES

Racial Diversity



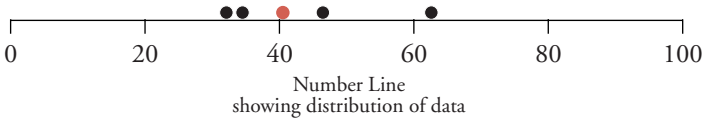
Educational Attainment

Educational attainment indicators measure the average amount of formal education that a county's residents have received. One indicator of educational attainment is the percentage of adults who have attended or graduated from college. Educational attainment influences many aspects of life, such as how much money people earn, what they do for recreation, where they get their information, and how they participate in civic life. With regard to park management, the educational attainment of the general public is an important consideration in marketing, public participation processes, and the design of interpretive programs. Within the Harpers Ferry NHP region, the percentage of adults with some college education (1990) ranges from 32.1% (Washington) to 62.3% (Loudoun).

% total population ≥ 25 years old with some college or college degree (1990)

Loudoun	62.3
Frederick	46.4
Jefferson	34.5
Washington	32.1

40.5



Number Line
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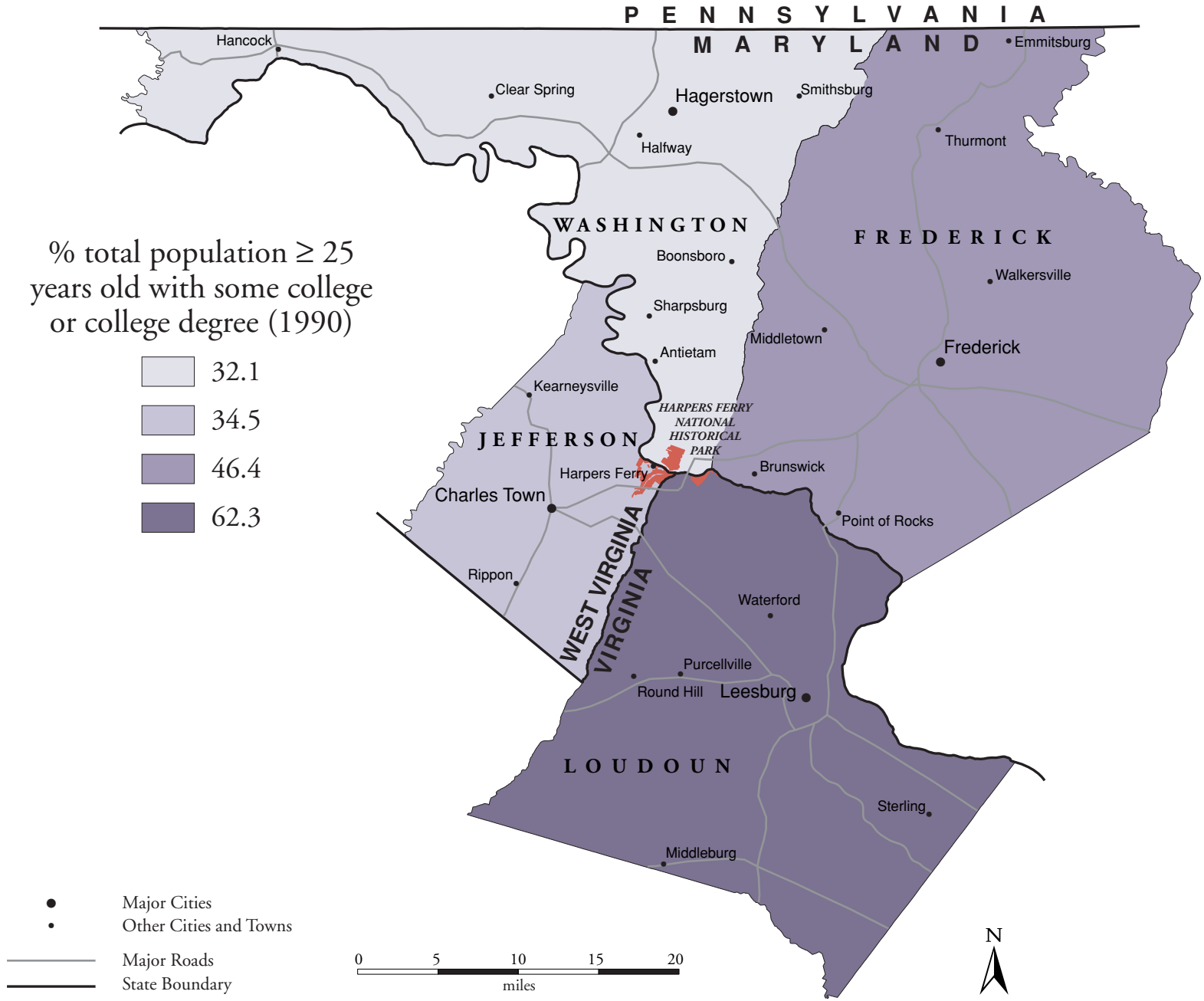
Educational Attainment



Religious Groups

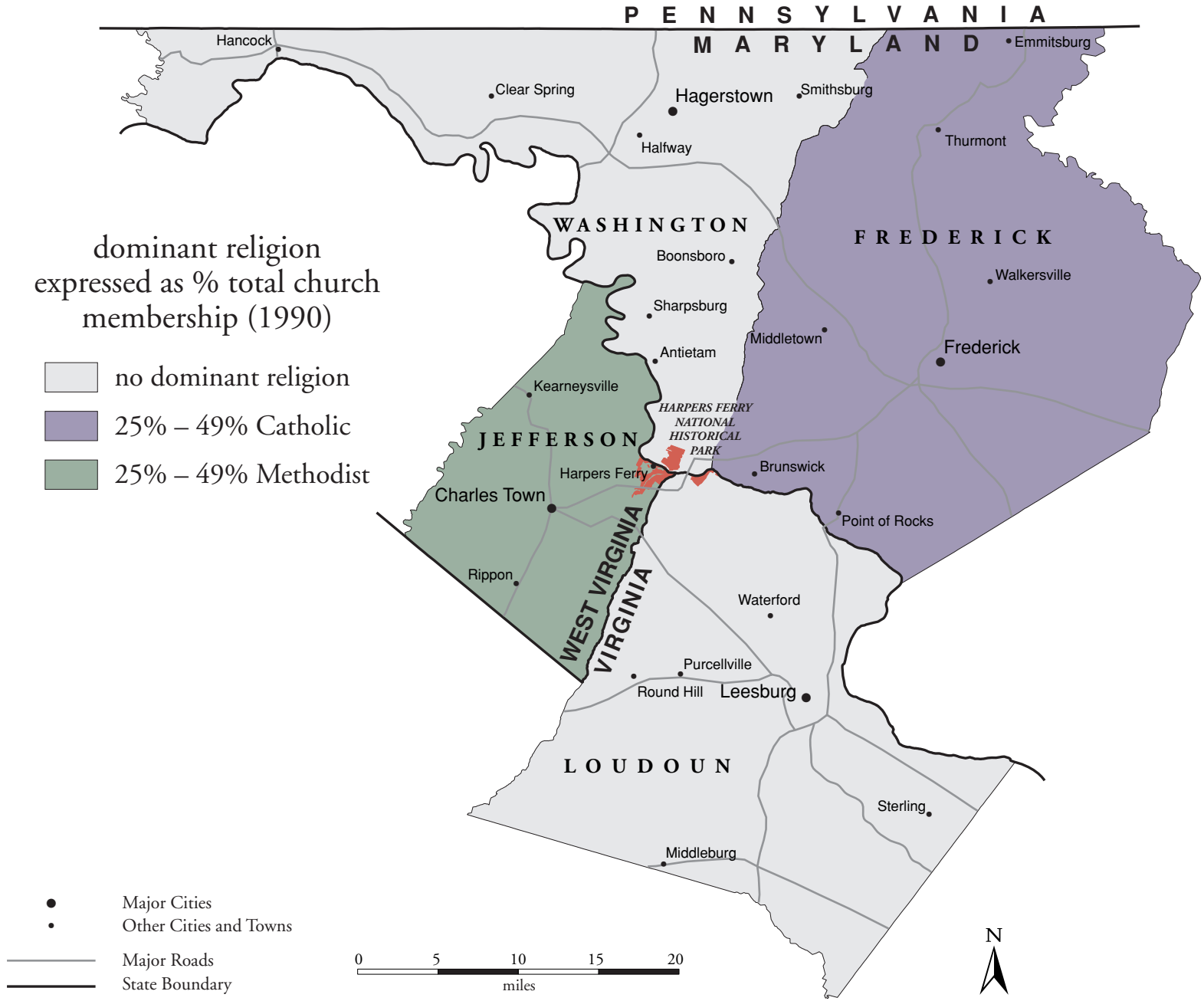
Indicators of religious affiliation measure the prevalence of various religious beliefs and practices, including membership in formal religious groups. One key indicator of religious participation is the presence of a relatively dominant religious group within a county (a group to which at least 25% of total church membership belongs). Membership in religious groups is an important social force in many ways, not only because it influences individual and group behavior (religious holidays, for example), but also because religious groups are often important community organizations. Formal religious groups create networks for sharing information and ideas, and they can also exert influence on issues ranging from environmental protection to advocacy for social change. Within the Harpers Ferry NHP region (1990), Methodists constitute at least 25% of the total church membership of Jefferson County, while Catholics constitute at least 25% of the total church membership of Frederick County.

dominant religion expressed as % total church membership (1990)

Frederick	25-49 Catholic
Jefferson	25-49 Methodist
Loudoun	no dominant religion
Washington	no dominant religion

NOTES

Religious Groups



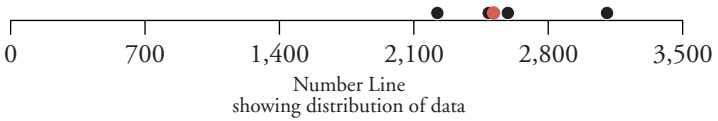
Crime

Crime indicators measure the frequency of various types of lawbreaking. One commonly used crime indicator is the number of serious crimes reported per 100,000 people. Serious crimes refer to murder and non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny-theft, arson, and motor vehicle theft. A high crime rate has many impacts on the general population, such as higher insurance rates and a reduced sense of security. Crime also affects government by increasing the demand for police, court services, and prisons. Crime presents direct challenges to park management, as the protection of visitors, park property, and resources becomes a greater priority. Within the Harpers Ferry NHP region, the number of serious crimes reported per 100,000 people (1993) ranges from 2,203 (Jefferson) to 3,076 (Frederick).

number of serious crimes per 100,000 people (1993)

Frederick	3,076
Washington	2,564
Loudoun	2,467
Jefferson	2,203

2,516



Number Line
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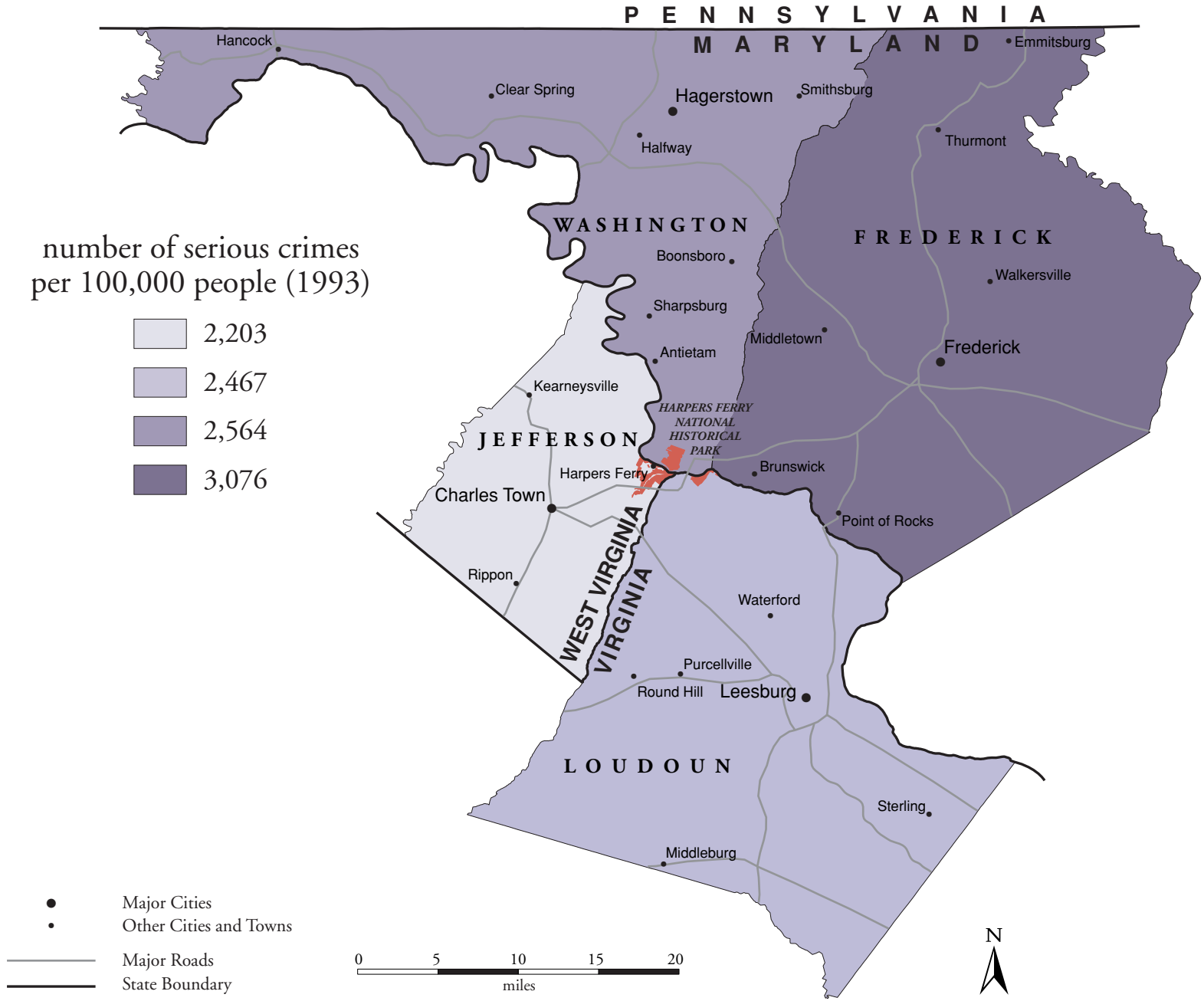
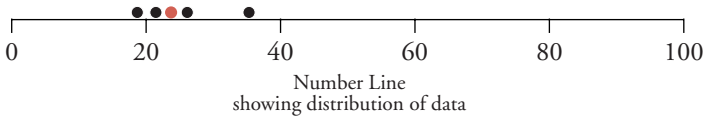
Crime


PENNSYLVANIA
MARYLAND
Hancock
Clear Spring
Hagerstown
Smithsburg
Emmitsburg
Thurmont
Halfway
WASHINGTON
FREDERICK
Boonsboro
Walkersville
Sharpsburg
Middletown
Frederick
Antietam
Kearneysville
HARPERS FERRY NATIONAL HISTORICAL PARK
JEFFERSON
Harpers Ferry
Brunswick
Charles Town
Point of Rocks
WEST VIRGINIA
VIRGINIA
Rippon
Waterford
Purcellville
Round Hill
Leesburg
LOUDOUN
Sterling
Middleburg
number of serious crimes per 100,000 people (1993)
2,203
2,467
2,564
3,076
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 5 10 15 20
miles
N

Recreation/Tourism Establishments

The recreation/tourism industry is composed of three categories: lodging (ranging from hotels to campsites), entertainment (such as movie theaters and museums), and personal services (such as dry cleaning and tax preparation). Recreation/Tourism indicators measure the size of the recreation/tourism industry as a share of the overall sales/services sector of the economy. The size of that share is a broad indicator of a county's economic reliance on recreation/tourism. Recreation/tourism establishments can be proponents of actions that enhance their area's attractiveness as a visitor destination (such as transportation improvements, protection of scenic or cultural landmarks, or marketing campaigns). Recreation/tourism establishments also can be vulnerable to, and thus wary of, actions, policies, or chance events that could affect business, such as visitor use restrictions, fires, or economic downturns. Within the Harpers Ferry NHP region, the percentage of county sales/service establishments devoted to recreation/tourism (1992) ranges from 18.5% (Loudoun) to 35.2% (Jefferson).[8]



Number Line
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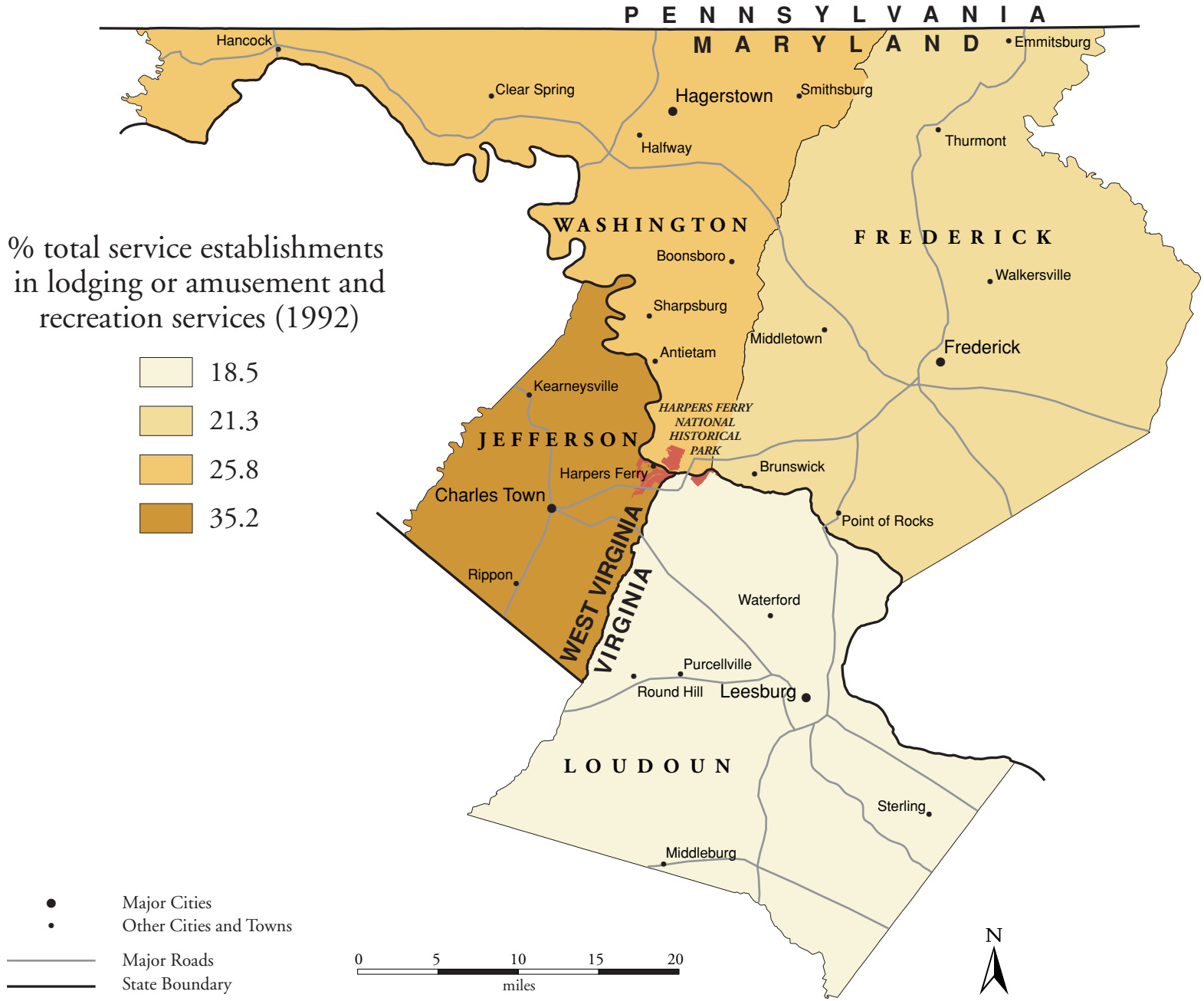
% total service establishments in lodging or amusement and recreation services (1992)

Jefferson	35.2
Washington	25.8
Frederick	21.3
Loudoun	18.5

23.6

NOTES

Recreation/Tourism Establishments



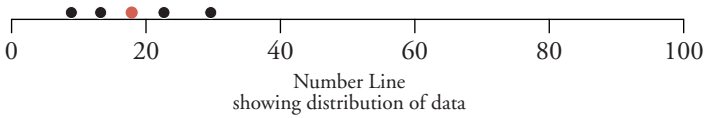
Recreation/Tourism Revenue

Recreation/tourism revenue is a key indicator of the economic importance of recreation/tourism to a county. Recreation/tourism revenue can be expressed as the percentage of total sales/service receipts. Recreation/tourism establishments can occupy an important position within a county economy because they attract visitor dollars from elsewhere. Secondary economic benefits are realized when these dollars are re-spent within the local economy or deposited in banks, where they provide capital to other businesses. Within the Harpers Ferry NHP region, the recreation/tourism share of total sales/service receipts (1992) ranges from 8.8% (Frederick) to 29.4% (Jefferson).[9]

% total service receipts from lodging or amusement and recreation services (1992)

Jefferson	29.4
Washington	22.6
Loudoun	13.2
Frederick	8.8

17.9



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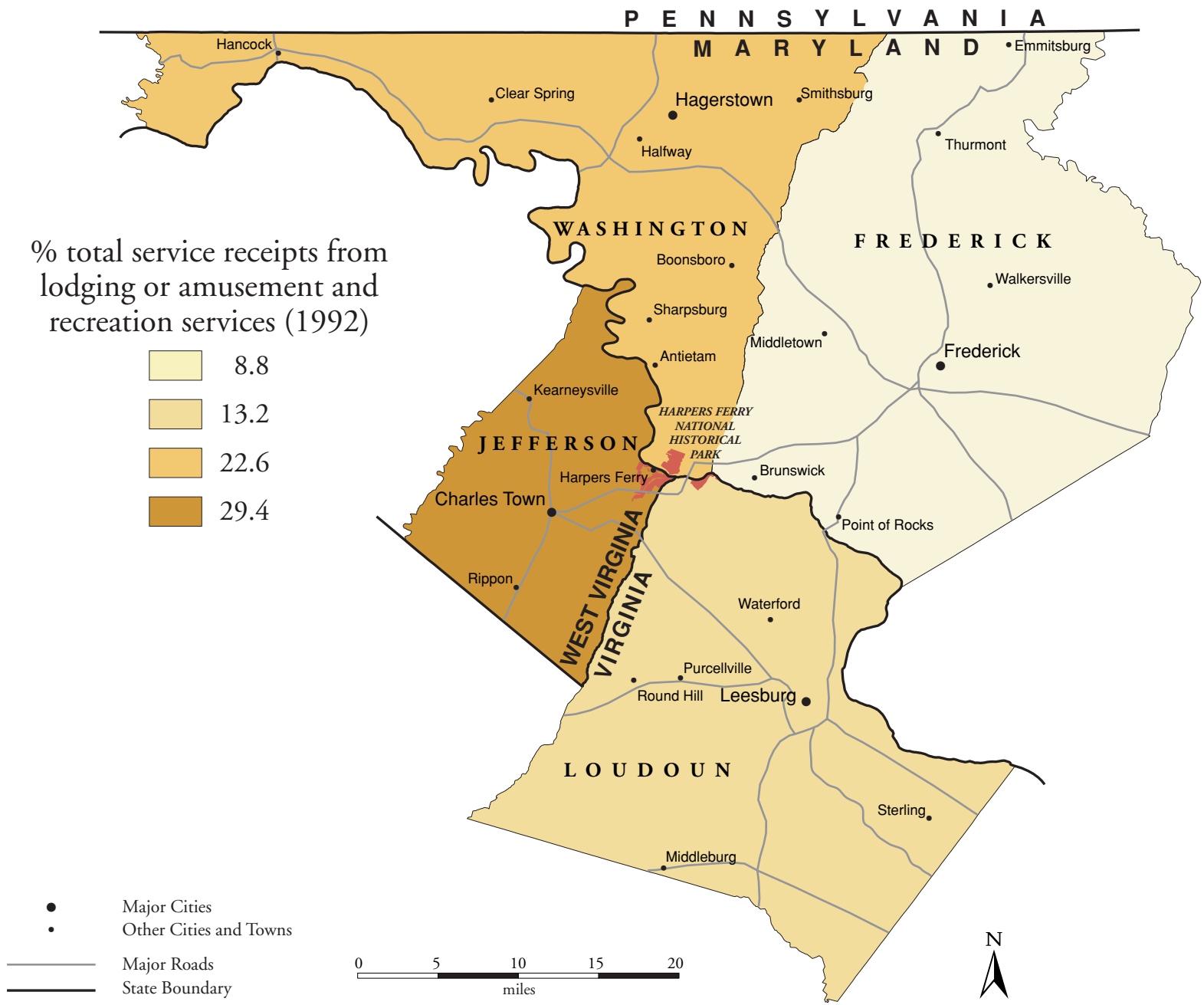
Recreation/Tourism Revenue



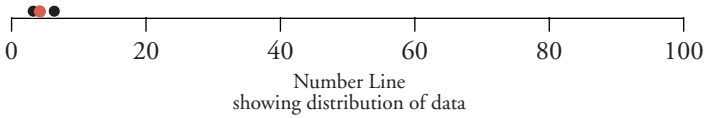
Recreation/Tourism Employment

The significance of the recreation/tourism industry to a county economy can be indicated by the percentage of county workers that it employs. Workers counted as recreation and tourism employees include art gallery docents, blackjack dealers, campground employees, fishing guides, hairstylists, motel attendants, and other providers of personal services. A high level of recreation/tourism employment may mean that residents have more disposable income or that the area attracts visitors or vacationers. Within the Harpers Ferry NHP region, the percentage of the civilian labor force employed in recreation/tourism (1990) ranges from 3.3% (Frederick) to 6.2% (Jefferson).[10]

% employed civilian labor force in personal, entertainment, and recreation services (1990)

Jefferson	6.2
Loudoun	3.5
Washington	3.4
Frederick	3.3

3.5



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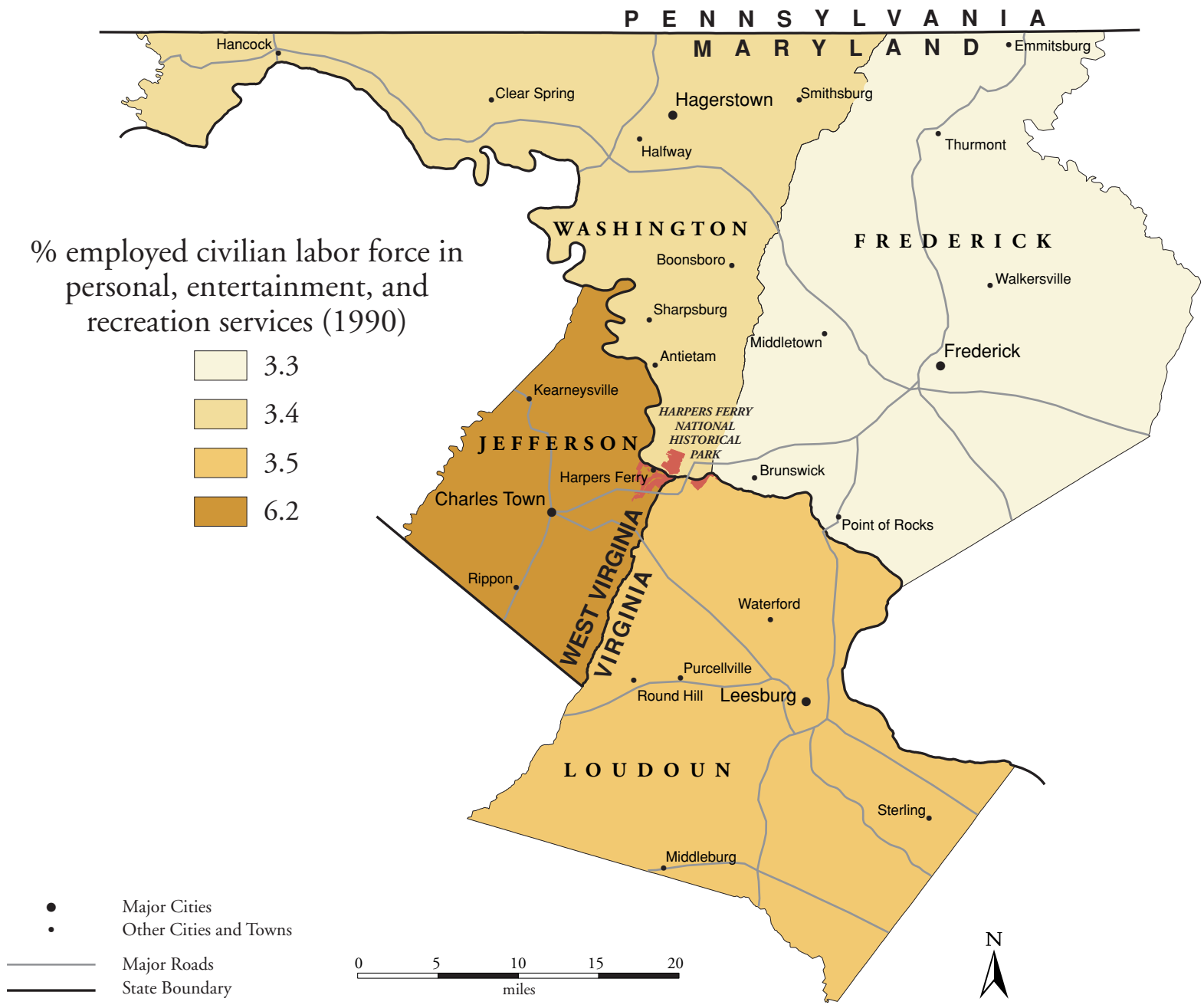
Recreation/Tourism Employment



Congressional Districts

Congressional districts form a key layer in the political structure of the Harpers Ferry NHP region. These districts, roughly equivalent in population, are defined by state legislatures based on the national census and redrawn every ten years. Members of Congress are key points of access for citizens seeking to influence federal-level policies and programs, including those related to federal lands such as national parks and national forests. The Harpers Ferry NHP region includes portions of 3 Congressional districts: Maryland's 6th District, Virginia's 10th District, and West Virginia's 2nd District, based on the 1990 Census.

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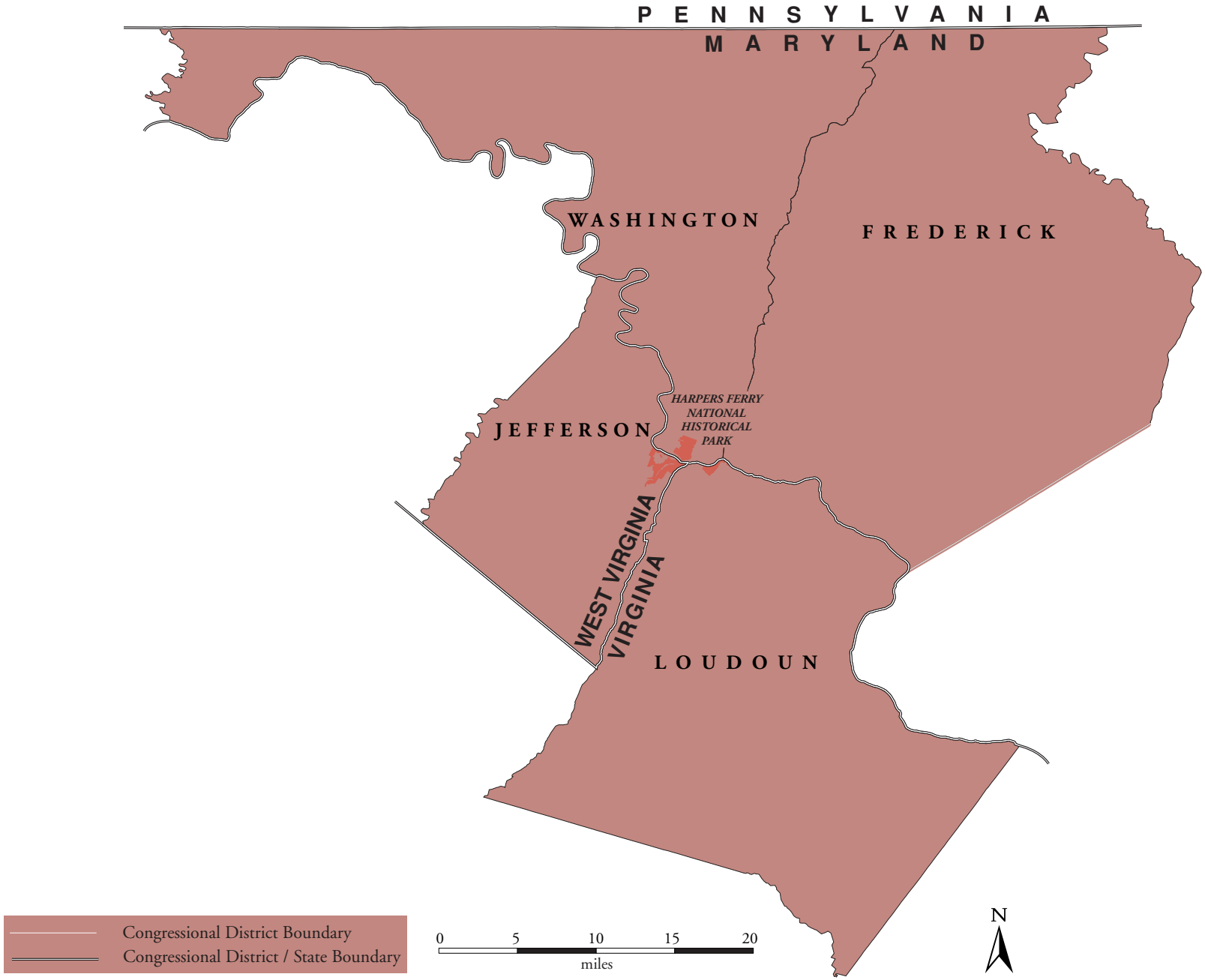
Congressional Districts



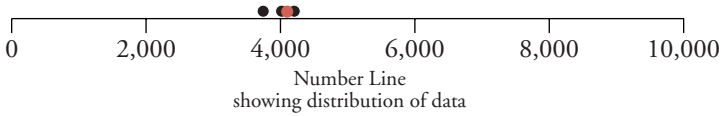
Federal Expenditures

The importance of the federal government to a county economy can be indicated by the amount of federal expenditures in the county. These expenditures can be a key source of dollars flowing into the county economy (in contrast, taxes and fees are an outflow of dollars). Federal spending can influence the park region through such wide-ranging initiatives as agricultural subsidies, social programs, military bases, and national parks. Within the Harpers Ferry NHP region, federal expenditures per person (1998) range from $3,749 (Frederick) to $4,169 (Jefferson).[11]

federal expenditures per capita ($) (1998)

Jefferson	4,169
Washington	4,160
Loudoun	3,987
Frederick	3,749

4,074



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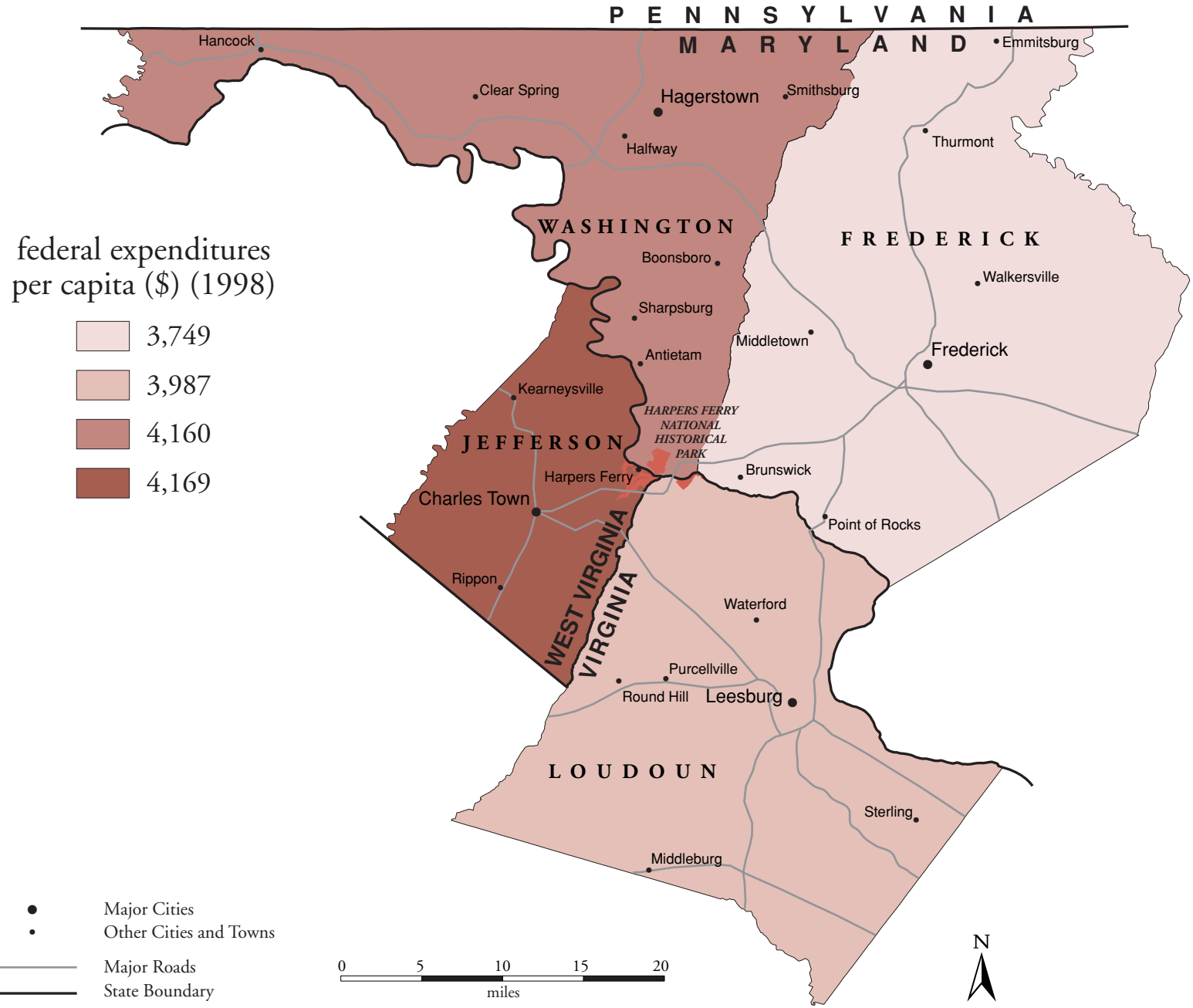
Federal Expenditures



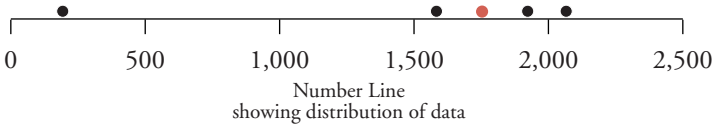
Local Government Revenue

Local government revenue in the form of county taxes, state and federal fiscal aid, and other miscellaneous county service charges, may indicate the degree of local government activity that a county's residents demand or are willing to support. Sources of such state or federal fiscal aid, also known as intergovernmental revenue, can include grants-in-aid, reimbursements for established services such as the care of prisoners or contractual research, and payments in lieu of taxes. Residents of a county with high local government revenue may tend to be more accustomed to government taking an active role in a broad range of programs, whereas residents of a county with low local government revenue may be accustomed to government providing only essential services. Such expectations about the role of government can play a role in shaping local and regional responses to resource management challenges. Within the Harpers Ferry NHP region, local government revenue per person (1997) ranges from $188 (Jefferson) to $2,060 (Loudoun).

local government revenue per capita ($) (1997)

Loudoun	2,060
Frederick	1,920
Washington	1,577
Jefferson	188

1,749



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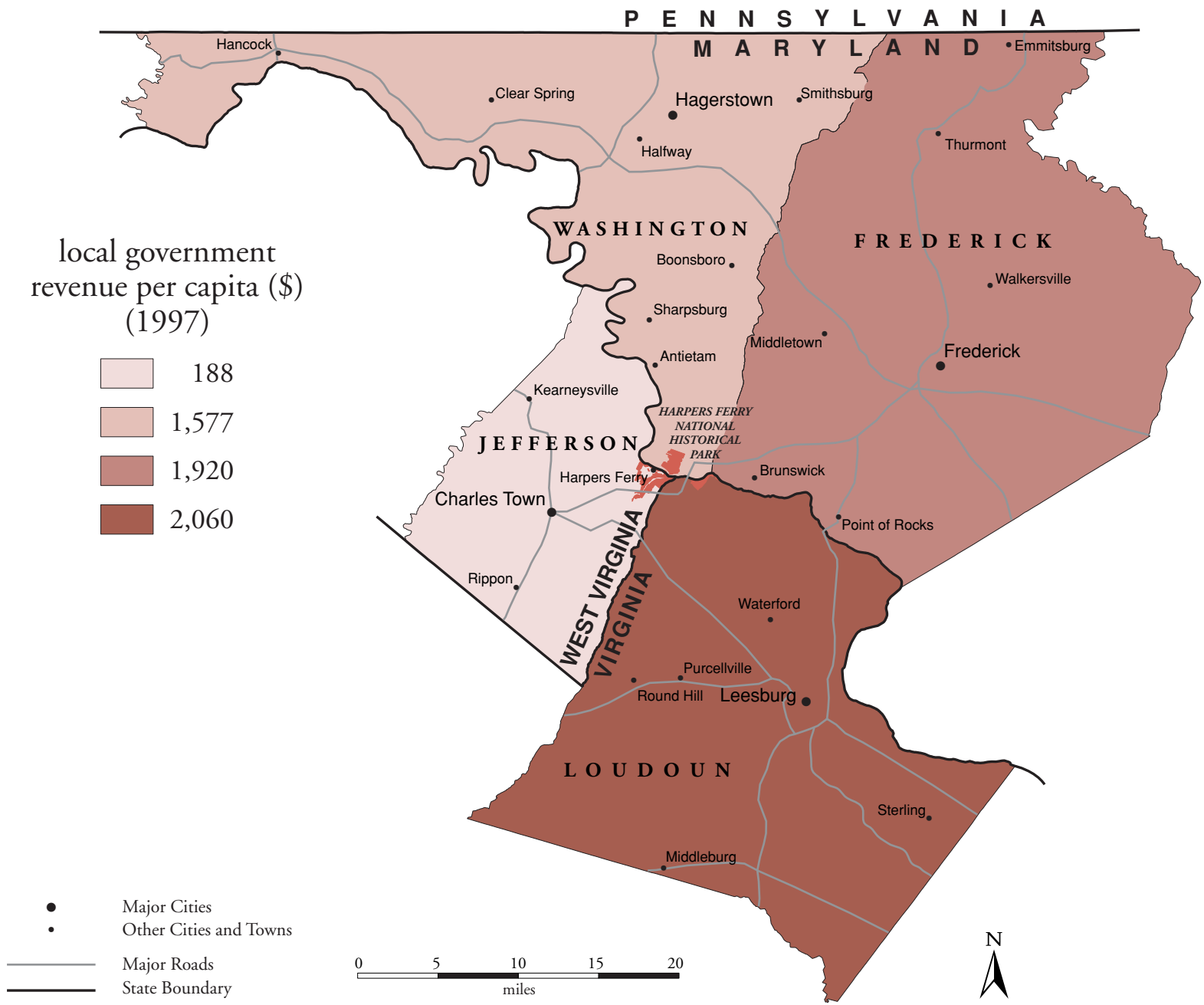
Local Government Revenue



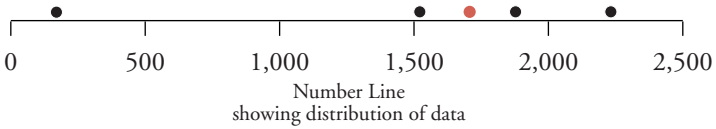
Local Government Expenditures

The level of activity of local government can be indicated by measuring local government expenditures per person. As the principal means of collective decision-making at the local scale, local governments commit resources to state and federally mandated services (such as schools and police protection) as well as other optional or non-essential services (such as garbage collection and recreation). Local governments vary in terms of the range of programs they administer and the amount of resources committed to programs. Within the Harpers Ferry NHP region, local government expenditures per person (1997) range from $163 (Jefferson) to $2,231 (Loudoun).

local government expenditures per capita ($) (1997)

Loudoun	2,231
Frederick	1,871
Washington	1,521
Jefferson	163

1,696



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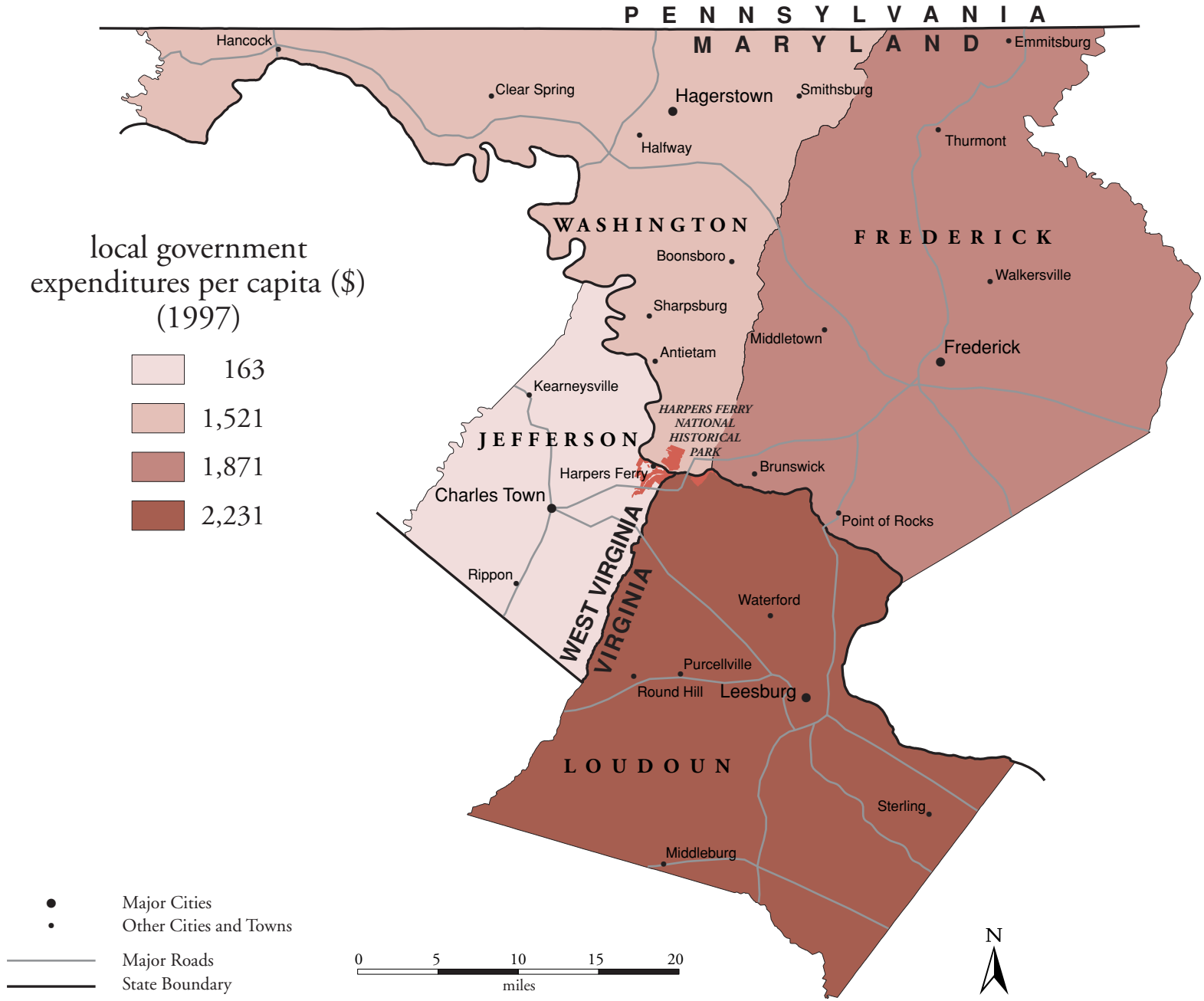
Local Government Expenditures



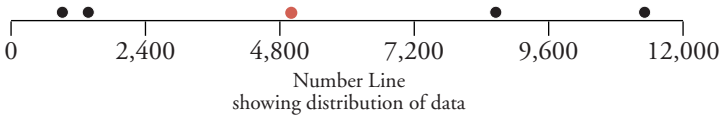
Payments in Lieu of Taxes

Payments in lieu of taxes are measured as the total dollars transferred to counties by the federal government as part of the PILT Program (Payments-In-Lieu-of-Taxes) administered by the Bureau of Land Management. PILT payments are calculated according to a formula that includes population and the amount of federal land within an affected county. They have a direct impact on the park region as revenue for county governments. As counties use this revenue for capital projects or service provisions, the tax burden on local residents is effectively reduced. Indirectly, PILT payments are an indication of the federal government's presence, visibility, and perhaps influence within counties in the park region. Within the Harpers Ferry NHP region, payments in lieu of taxes (1998) range from $895 (Loudoun) to $11,288 (Frederick).

total payments transferred to counties ($) (1998)

Frederick	11,288
Washington	8,645
Jefferson	1,364
Loudoun	895

5,005



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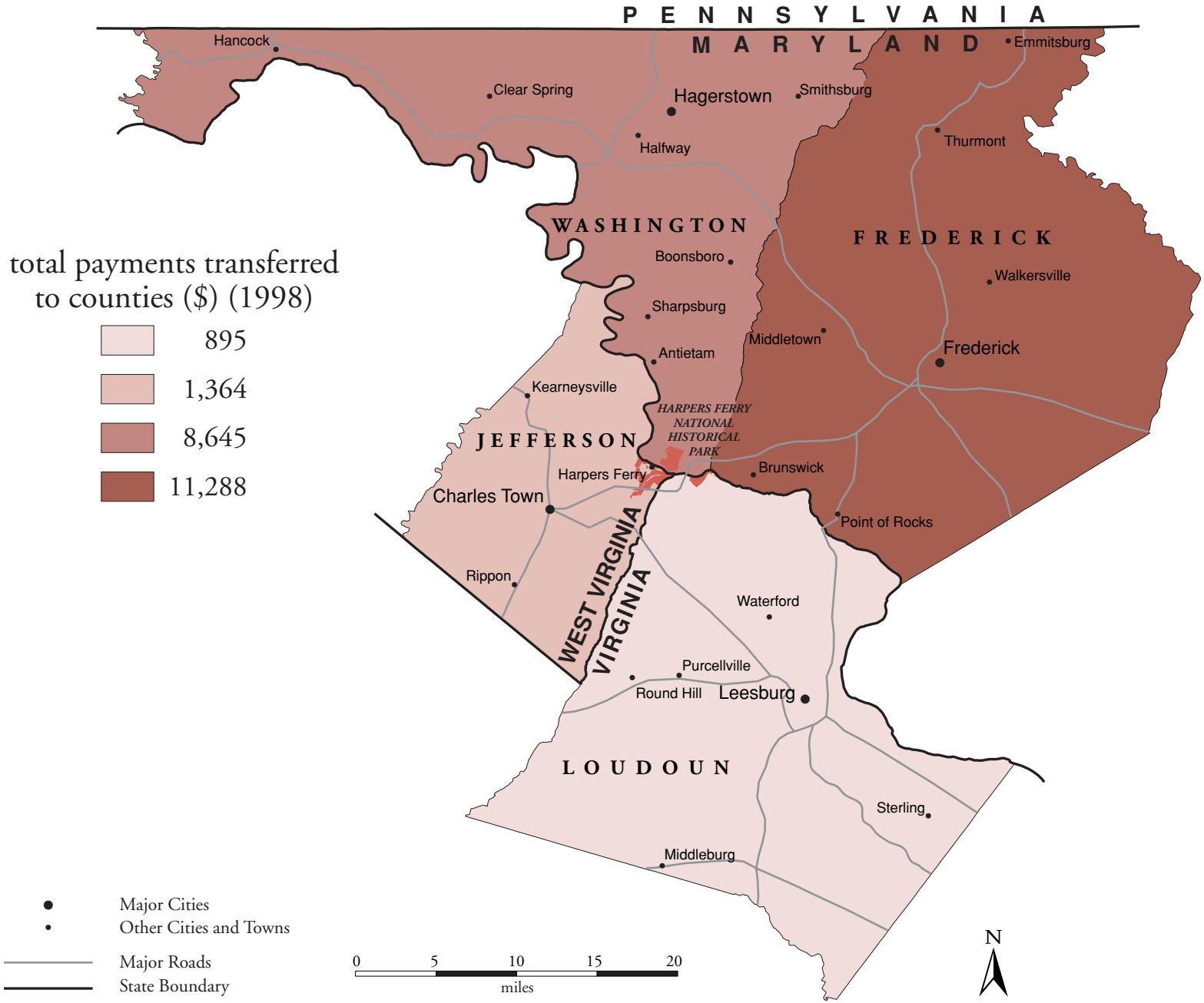
Payments in Lieu of Taxes



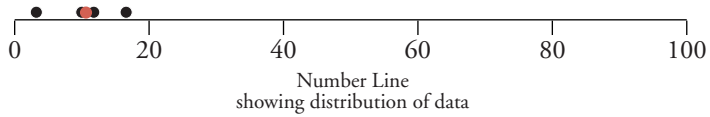
Federal Grants

Federal grants are a specific type of spending, generally intended to assist local governments in carrying out major capital projects or program enhancements. These grants differ from other federal expenditures in that they are centrally received and administered (as opposed to individual wages and loans), are short-term disbursements (as opposed to entitlement programs), and are not exchanged for any goods or services (as opposed to salaries and procurement). Federal grants represent an important short-term flow of dollars into a county. If a county receives a relatively high percentage of federal expenditures in the form of grants, this may indicate that other types of federal spending in the county are relatively limited. It also may indicate that the county has a relatively greater need for grant-funded projects and programs such as roads, sewage treatment, and school subsidies. Within the Harpers Ferry NHP region, the percentage of federal expenditures received in the form of grant awards (1998) ranges from 3.2% (Loudoun) to 16.5% (Washington).[12]

% total federal expenditures received as grant awards (1998)

Washington	16.5
Jefferson	11.6
Frederick	9.8
Loudoun	3.2

10.7



Number Line
showing distribution of data

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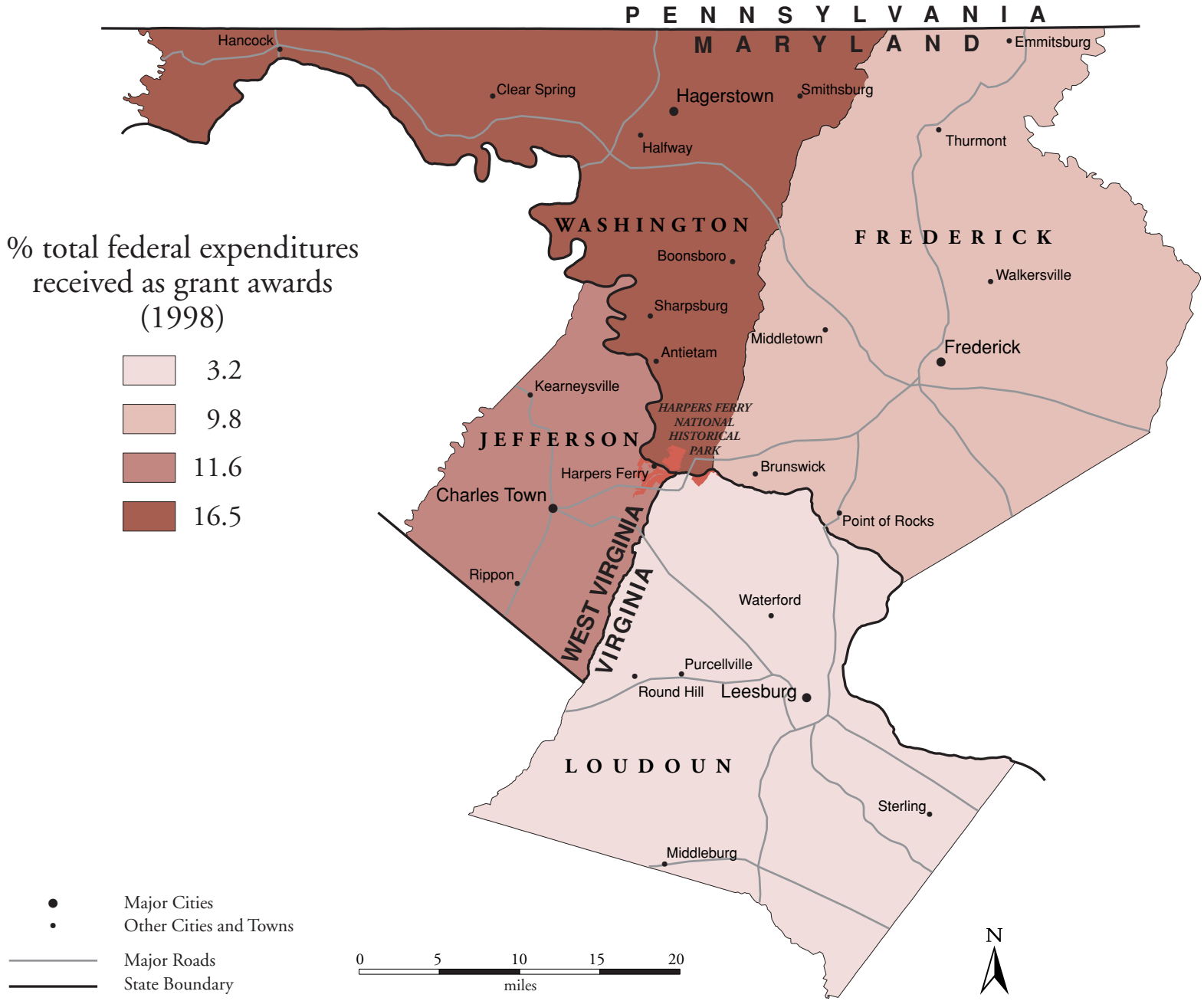
Federal Grants



Ecoregions

Ecoregions are areas in which similar climate, landforms, and soil exist and support similar communities of vegetation and animals. People affect natural systems within an ecoregion through such activities as agriculture, development, the creation of protected areas, hunting, and the introduction of non-native species. Natural resource protection efforts throughout an ecoregion may share many of the same approaches and techniques, since these efforts often focus on maintaining or restoring similar communities of indigenous animals and plants. Hence, many challenges of resource protection can be fruitfully addressed at the ecoregional level. The Harpers Ferry NHP region includes parts of three ecoregion divisions; eastern Frederick county is classified as part of the Hot Continental division. All of Washington and Jefferson counties and the western parts of Frederick and Loudoun counties are classified as the Hot Continental Regime Mountain division. Southeastern Loudoun county is classified as part of the Subtropical division.

Bailey's Ecoregions

Ecoregions are ecosystems of regional extent, differentiated according to a hierarchical scheme which uses climate and vegetation as indicators of the extent of each unit. Ecoregional classifications were developed by Robert Bailey of the U.S. Forest Service, U.S. Department of Agriculture (Bailey, Robert G. 1995. Description of the ecoregions of the United States (2nd edition). Misc. Pub. No. 1391, Map scale 1:7,500,000. Following are abridged descriptions of the three ecoregions which overlay the Harpers Ferry NHP region.

Hot Continental – warm to hot summers and cold winters. There is year round precipitation, a great amount of it occurring in summer. Typically composed of a temperate deciduous forest that has continuous canopy in the summer and sheds its leaves completely in the winter. Common species are oaks, beech and yellow-poplar.

Hot Continental Regime Mountains – climate is temperate, with distinct summer and winter, and all areas are subject to frost. Precipitation is distributed throughout the year, large snow accumulation occurs in the winter. Typically composed of an oak-pine forest mix. Chestnut was once abundant here (and in the Hot Continental), but a blight has eliminated it as a canopy tree.

Subtropical – hot summers with high humidity and mild winters, but frost still occurs nearly every winter. Precipitation is distributed evenly throughout the year, a peak occurring during midsummer or early spring in the form of thunderstorms. Summer droughts can occur, snow falls rarely and melts almost immediately. Typically composed of broadleaf deciduous and needleleaf evergreen trees.

Ecoregions


PENNSYLVANIA
MARYLAND
Hancock
Clear Spring
Hagerstown
Smithsburg
Emmitsburg
Halfway
Thurmont
WASHINGTON
FREDERICK
Boonsboro
Walkersville
Sharpsburg
Middletown
Frederick
Antietam
Kearneysville
HARPERS FERRY NATIONAL HISTORICAL PARK
JEFFERSON
Harpers Ferry
Brunswick
Charles Town
Point of Rocks
Rippon
WEST VIRGINIA
VIRGINIA
Waterford
Purcellville
Round Hill
Leesburg
LOUDOUN
Sterling
Middleburg
ecoregion division boundaries (1995)
Hot Continental
Hot Continental Regime Mountains
Subtropical
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 5 10 15 20
miles
N

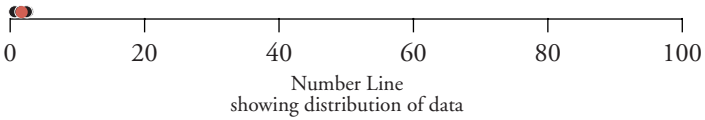
Federal Lands

One indicator of the federal government's role in regional resource management is the amount of land in federal ownership. This amount can be measured as the percentage of the total land area in each county. Stewardship of private land is carried out through a combination of regulation, market forces, and voluntary action. In contrast, stewardship of public land is carried out through direct implementation of agency policies. Thus the variation in public versus private land ownership across the park region can significantly influence the design and implementation of resource protection strategies. Within the Harpers Ferry NHP region, federal land ownership (1998) ranges from 0.4% (Loudoun) to 2.2% (Washington).[13]

% land in federal ownership (1998)

Washington	2.2
Frederick	2.1
Jefferson	1.3
Loudoun	0.4

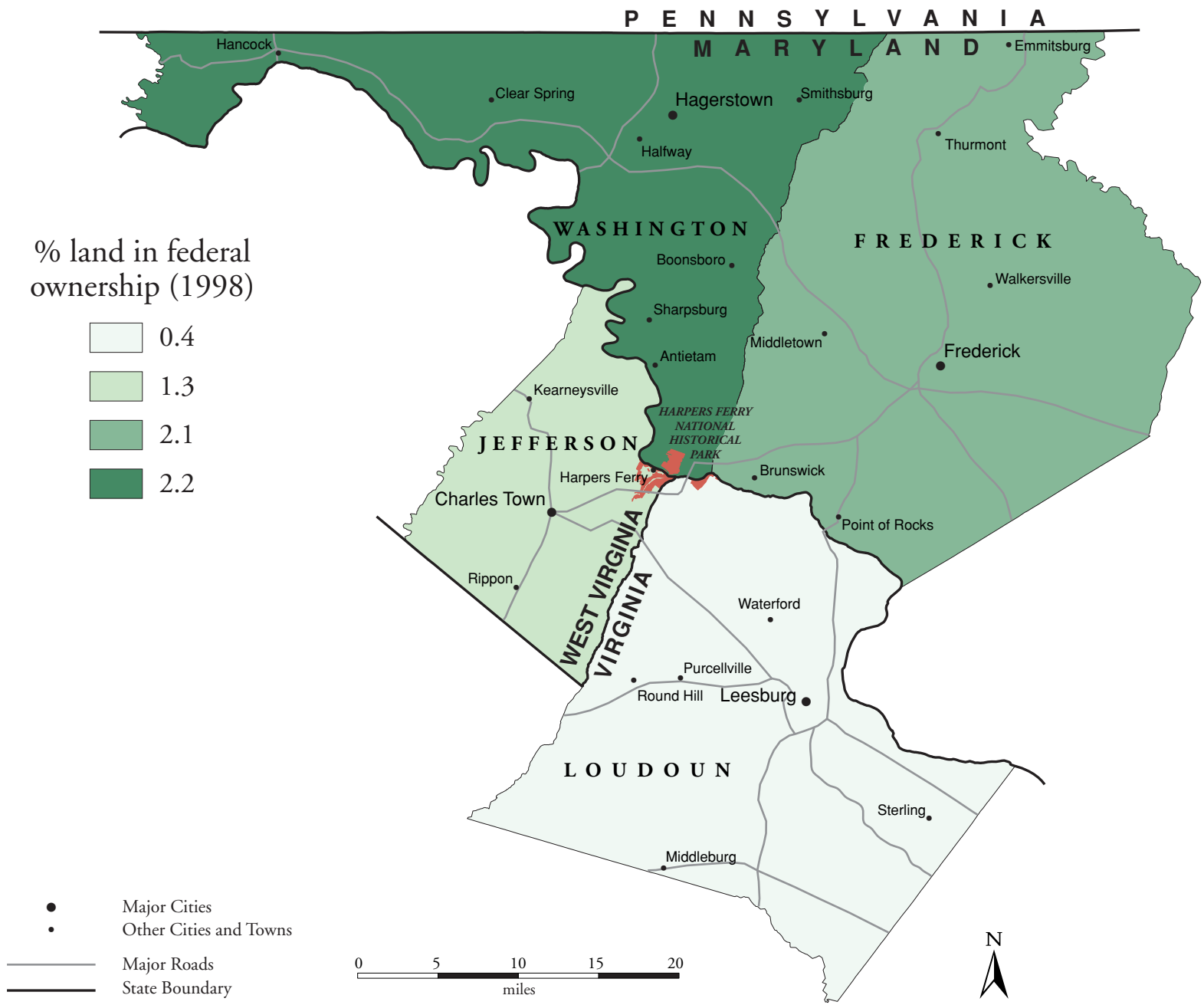
1.7



Number Line
showing distribution of data

NOTES

Federal Lands



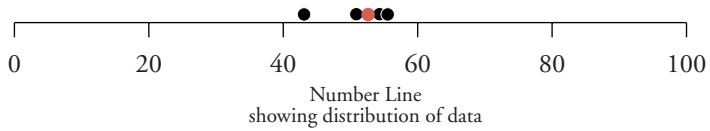
Farmland

The relative importance of farming within a county can be indicated by the percentage of the county's total land area that is classified as farmland. Farming includes crop cultivation as well as pasturing and grazing of livestock. Because damaged or degraded natural resources present a long-term threat to the health and profitability of farming, farm operators are potentially key partners in local and regional resource protection issues. Park management can require close coordination with area farmers on many issues, such as control of non-native species, species reintroduction, preservation of scenic values, allocation of scarce water supplies, or management of agricultural runoff. Within the Harpers Ferry NHP region, the percentage of total county land area classified as farmland (1997) ranges from 43.1% (Washington) to 55.6% (Loudoun).[14]

% land classified as farmland (1997)

Loudoun	55.6
Jefferson	54.3
Frederick	50.9
Washington	43.1

52.6



Number Line
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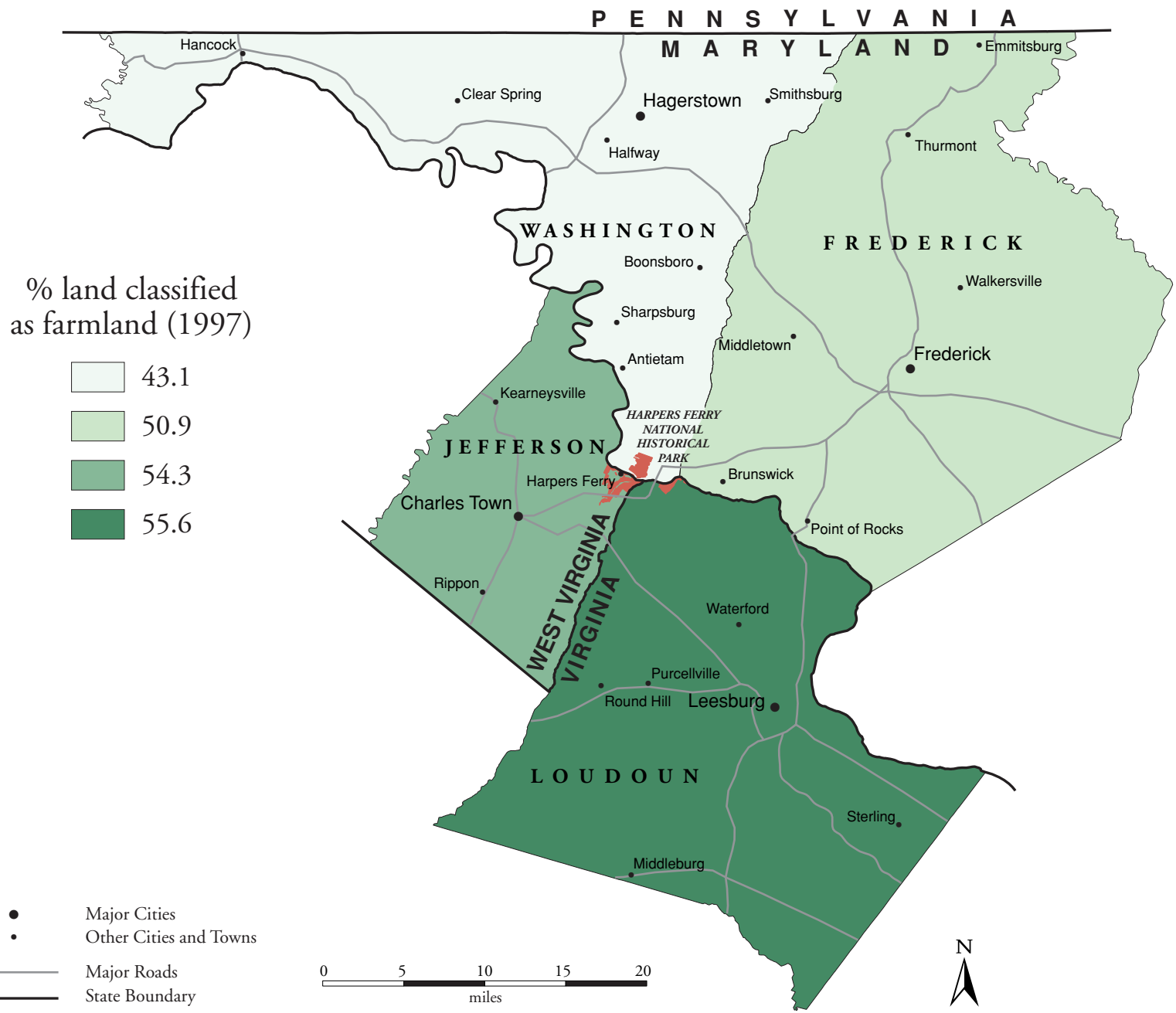
Farmland


PENNSYLVANIA
MARYLAND
Hancock
Clear Spring
Hagerstown
Halfway
Smithsburg
Emmitsburg
Thurmont
WASHINGTON
FREDERICK
Boonsboro
Walkersville
Sharpsburg
Middletown
Frederick
Antietam
Kearneysville
HARPERS FERRY NATIONAL HISTORICAL PARK
JEFFERSON
Harpers Ferry
Brunswick
Charles Town
Point of Rocks
Rippon
WEST VIRGINIA
VIRGINIA
Waterford
Purcellville
Round Hill
Leesburg
LOUDOUN
Sterling
Middleburg
% land classified as farmland (1997)
43.1
50.9
54.3
55.6
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 5 10 15 20
miles
N

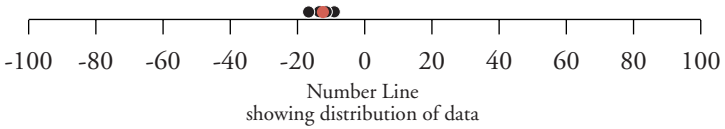
Change in Farmland

Changes in the amount of farmland provide an indication of economic and land use trends among counties in the park region. Land can be converted to farming because of increased demand for agricultural products or because new technology, business practices, or government programs make farming profitable. Land can be taken out of farming due to soil depletion, competition from other growers elsewhere, loss of labor, or conversion of land to other (often urban) uses. Within the Harpers Ferry NHP region (1982-1997), the amount of farmland decreased in all counties. That decrease ranged from 9.1% (Loudoun) to 16.7% (Jefferson).[15]

% change in acres of farmland (1982-1997)

Jefferson	-16.7
Washington	-13.5
Frederick	-11.5
Loudoun	-9.1

-12.5



Number Line
showing distribution of data

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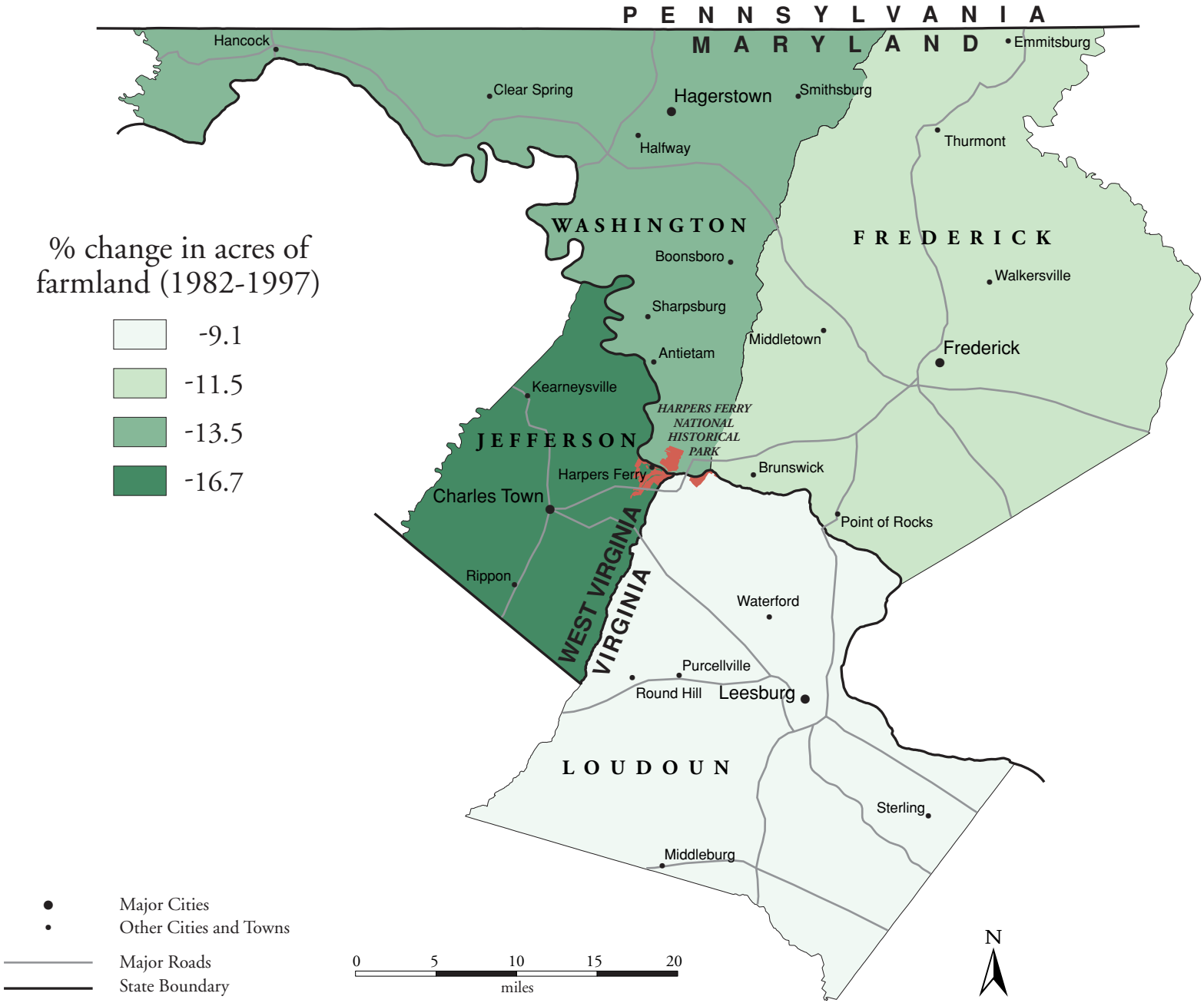
Change in Farmland



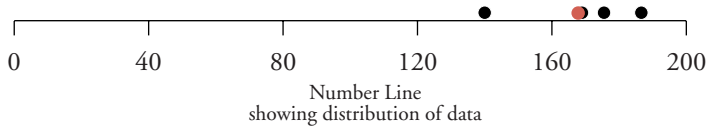
Domestic Water Use

Domestic water use can be measured in gallons per day per person. The rate of domestic water consumption can be indicative of local consumption patterns, attitudes toward conservation, the cost of water, or the amount of regulatory control over water use. Higher rates of domestic water use may be associated with a more active tourism industry or with a greater prevalence of water-intensive landscaping, swimming pools, and so forth. Relatively low rates of domestic water use may indicate the presence of higher water costs or stricter water conservation guidelines. Among the counties of the Harpers Ferry NHP region, domestic water use, per person (1995), ranges from 140 gallons/day (Jefferson) to 186 gallons/day (Washington).

gallons of water per day, per person (1995)

Washington	186
Loudoun	175
Frederick	169
Jefferson	140

172



Number Line
showing distribution of data

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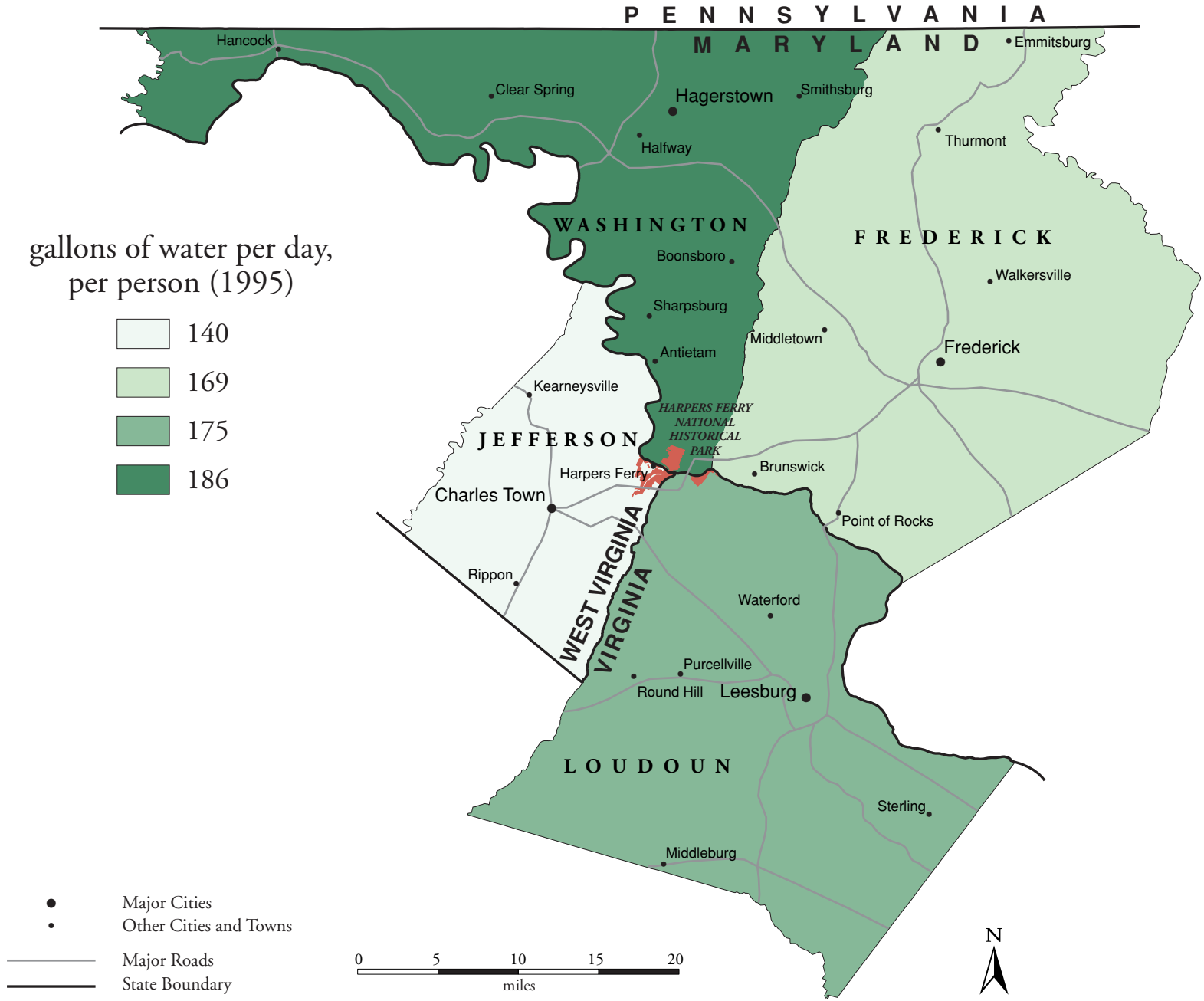
Domestic Water Use



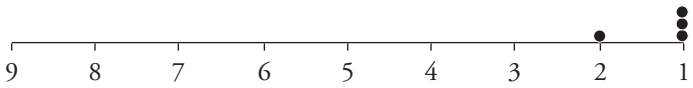
Urbanization

Urbanization is a measure of the degree to which land has been developed as towns and cities. The political and economic priorities of more urbanized counties tend to differ from those of less urbanized counties. The concentration of people in towns, cities, and large metropolitan areas creates opportunities for cooperative efforts (such as municipal water systems, public transportation, and a host of non-governmental organizations) but also can increase the incidence of problems such as congestion, air pollution, and habitat fragmentation. The Economic Research Service classifies counties' degree of urbanization along a continuum ranging from completely rural to large metropolitan. Within the Harpers Ferry NHP region (1997), Frederick, Loudoun, and Jefferson counties are classified as "large metropolitan," and Washington County is classified as "small metropolitan."[16]

level of urbanization (1997)

Fredrick	1
Jefferson	1
Loudoun	1
Washington	2

1 Part of large metro area of 1 million+
2 Part of small metro area of <1 million



Number Line
showing distribution of data

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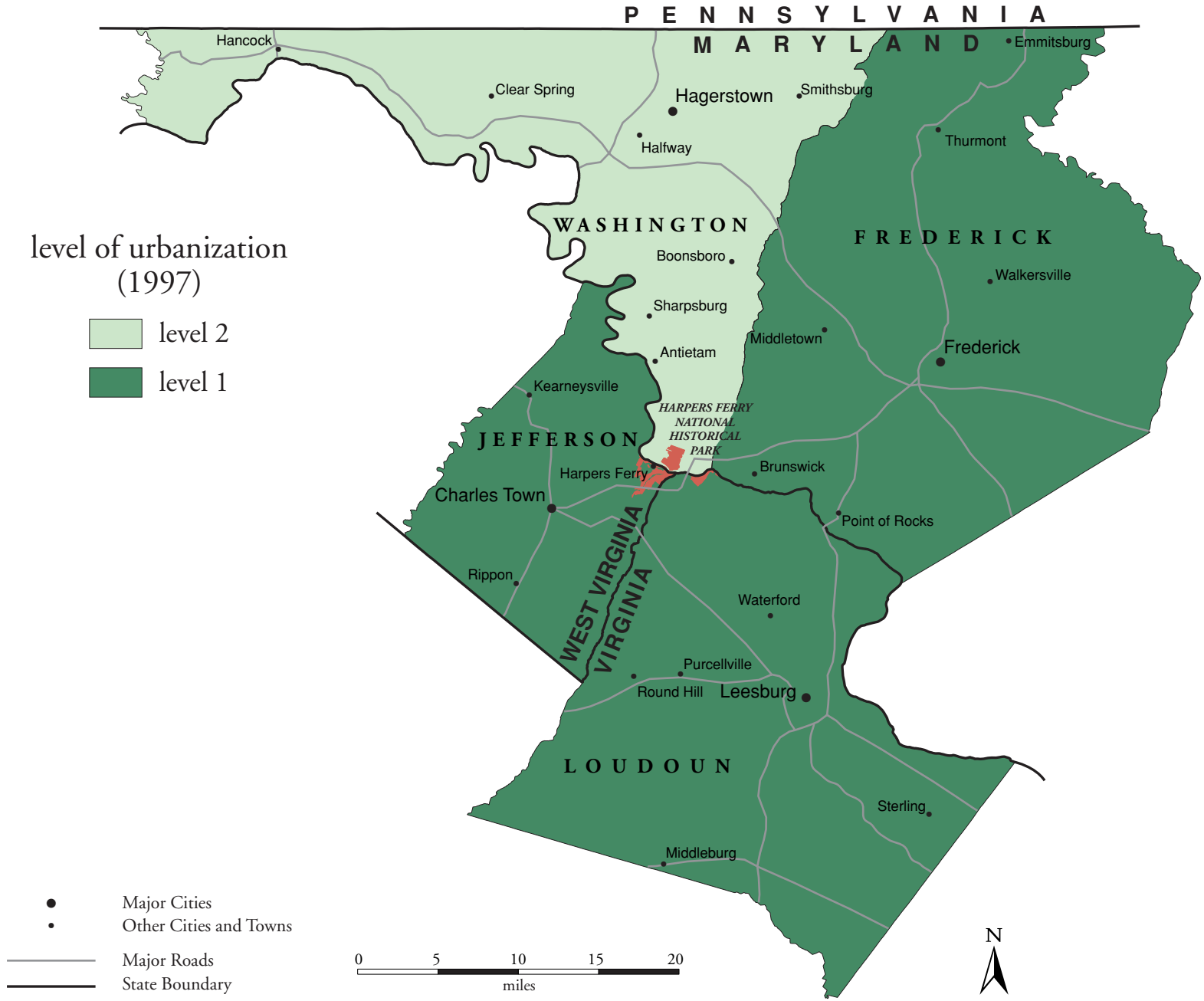
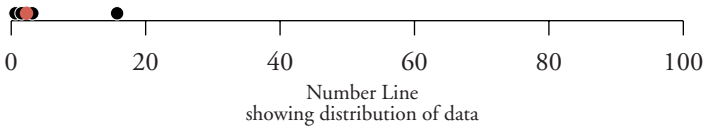
Urbanization



Change in Building Permits

One indicator of growth in a local economy is the annual change in the number of building permits issued for new privately-owned housing units. Growth in the number of building permits directly implies an accelerating demand for construction labor, supplies, and services. It indirectly implies that families are growing, or that industries are moving into an area and expanding economic output. Rapid growth can generate new political priorities (such as greater demand for roads and schools) and can increase land values. Growth also alters the human impact within the ecosystem through effects such as increased water consumption, loss of cropland or habitat, or greater valuation of open space. Within the Harpers Ferry NHP region, the average change in the number of building permits issued annually (1987-1997) ranges from 0.6% (Jefferson) to 15.6% (Loudoun).[17]



Number Line
showing distribution of data

average annual % change in the number of building permits issued (1987-1997)

Loudoun	15.6
Washington	3.0
Frederick	1.4
Jefferson	0.6

2.2

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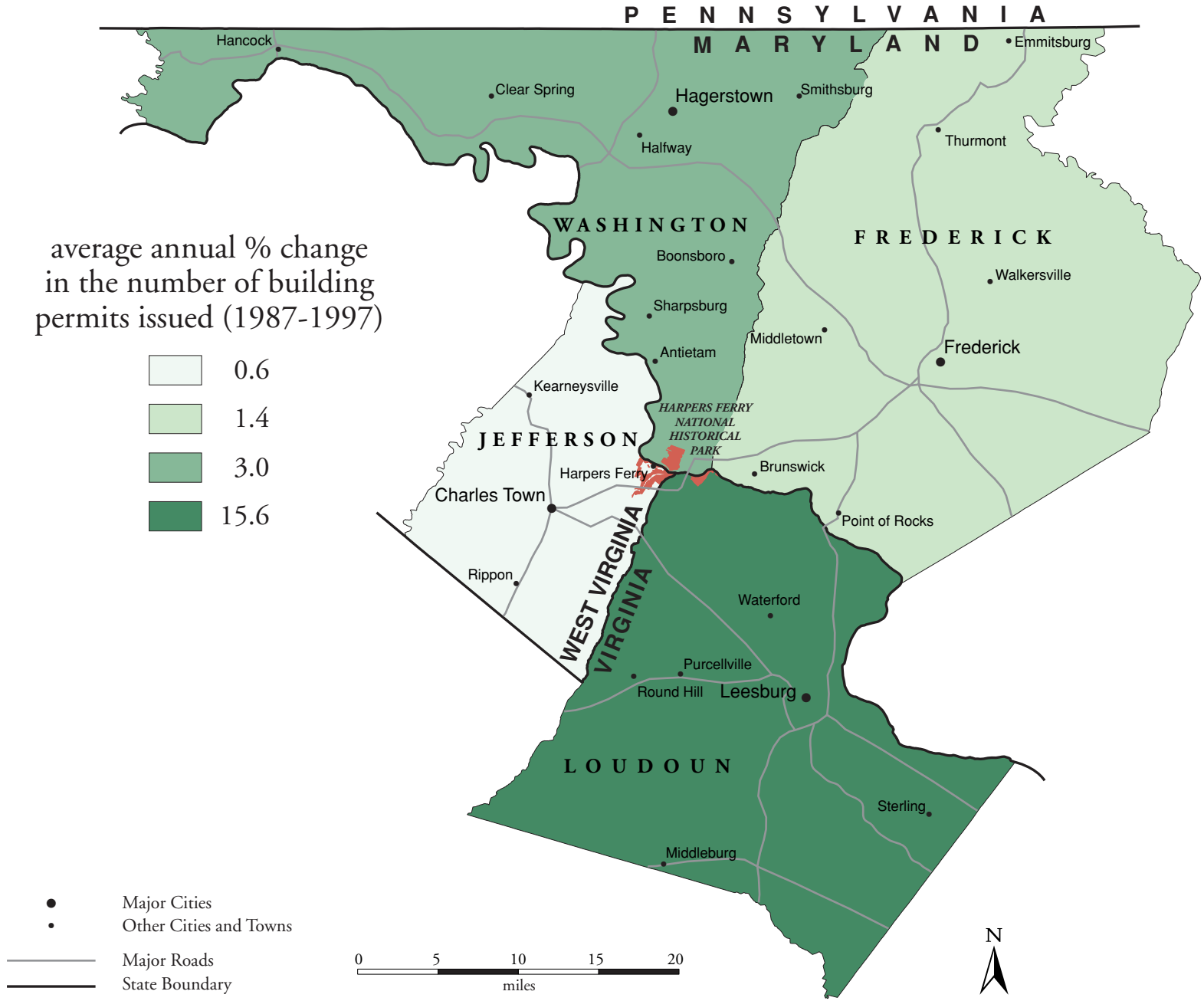
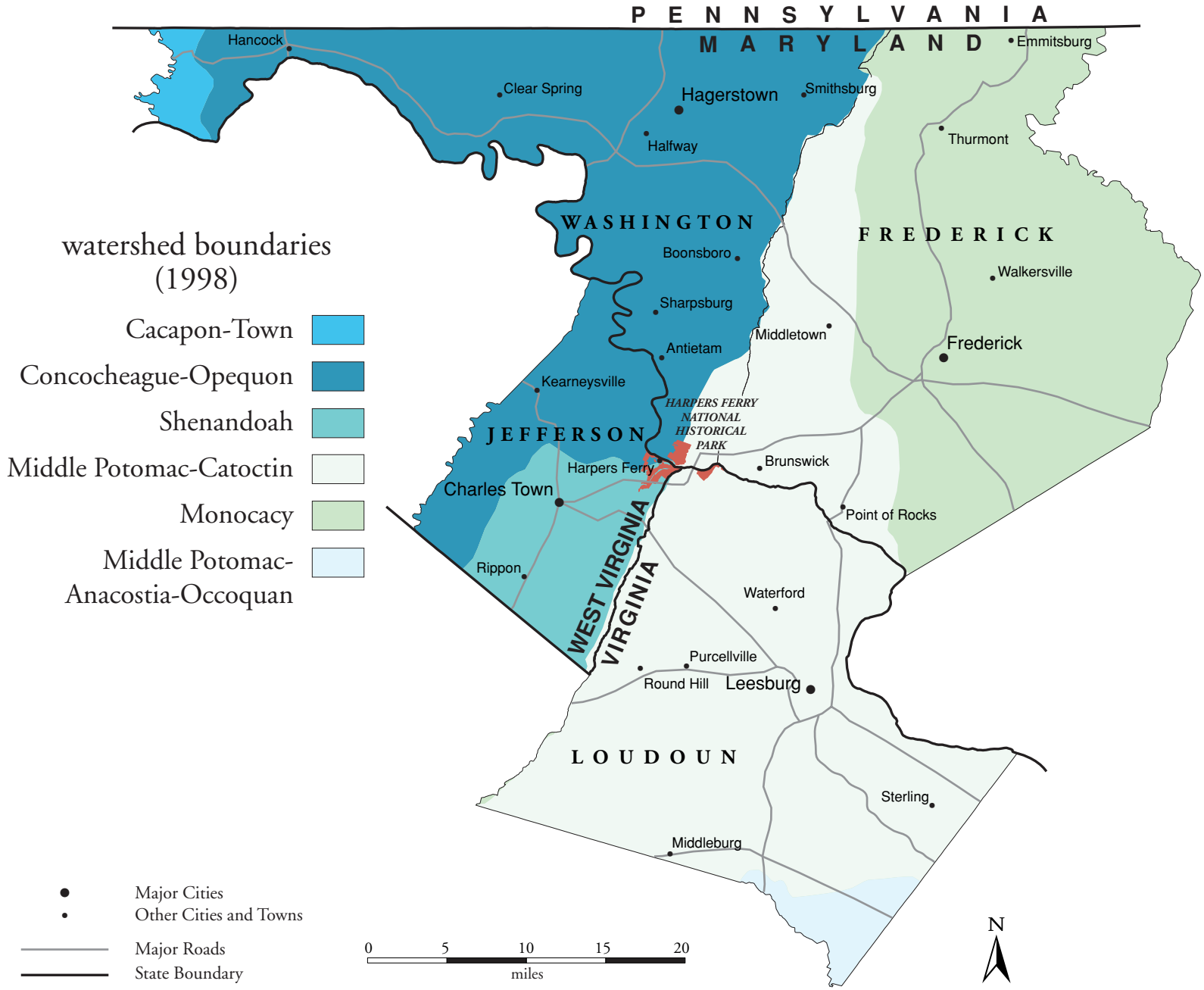
Change in Building Permits



Watersheds

Watersheds are delineated by the U.S. Geological Survey using a nationwide system based on surface hydrological features. This system classifies watersheds at the basin and sub-basin level. The sub-basin level, depicted in this atlas, corresponds to the Environmental Protection Agency's definition of a watershed. Watersheds are increasingly serving as the geographical units within which governments, institutions, and citizens organize to carry out initiatives for environmental protection and restoration. Familiarity with watershed boundaries is fundamental in developing educational programs and in mobilizing constituencies to protect water quality throughout the park region. The Harpers Ferry NHP region includes all or portions of six sub-basins, all of which are part of the Potomac River basin.

Watersheds


PENNSYLVANIA
MARYLAND
Hancock
Clear Spring
Hagerstown
Smithsburg
Emmitsburg
Thurmont
Halfway
WASHINGTON
FREDERICK
Boonsboro
Walkersville
Sharpsburg
Middletown
Frederick
Antietam
Kearneysville
HARPERS FERRY NATIONAL HISTORICAL PARK
JEFFERSON
Harpers Ferry
Brunswick
Charles Town
Point of Rocks
Rippon
WEST VIRGINIA
VIRGINIA
Waterford
Purcellville
Round Hill
Leesburg
LOUDOUN
Sterling
Middleburg
watershed boundaries (1998)
Cacapon-Town
Concocheague-Opequon
Shenandoah
Middle Potomac-Catoctin
Monocacy
Middle Potomac-Anacostia-Occoquan
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 5 10 15 20
miles
N

Conclusion: Using This Atlas for Park Management

A national park functions as part of a regional human ecosystem. A natural ecosystem can be understood in terms of factors such as flora, fauna, rainfall, temperature, elevation, and soil. Similarly, a *human ecosystem* can be understood in terms of factors such as population, commerce, social and cultural practices, politics, and land use patterns.

The regional human ecosystem, like the natural ecosystem, strongly influences the long-term health of the park's natural and cultural resources. Just as a park may be concerned with upstream activities outside its boundaries yet inside its watershed, parks are also concerned with human activities taking place outside their boundaries yet inside their region. Thus, knowledge of natural and human conditions external to a park is as essential to park management as knowledge of internal natural and cultural conditions.

This atlas focuses on human activities and features in the region surrounding Harpers Ferry National Historical Park. Five primary applications for this atlas as a tool for park management are:

- monitoring activities and analyzing trends that could have short or long-term impacts on the park,
- making comparative studies, both within the region and between regions,
- assessing potential social impacts of management decisions,
- supporting collaborative decision-making and public participation, and
- educating park staff and other stakeholders about regional socioeconomic trends.

Monitoring activities and analyzing trends. The standardized data sources and presentation format of this atlas allow it to serve as a baseline for long-term monitoring of human conditions and trends that impact the park, such as immigration, economic shifts, or changes in the level of poverty. These human conditions and trends can have significant implications for park planning and management. For example, the atlas can be consulted to determine trends in the prevalence of English language ability among regional residents. This information could be important in designing interpretive and public participation programs that can increase access to and advocacy on behalf of the park. The atlas can be used to gain knowledge about the overall structure of and local variations in the regional economy. This information could be important to developing a strong collaborative working relationship with regional business leaders. The atlas can be examined to recognize trends in land use. This information could support proactive planning to mitigate potential impacts of development such as habitat fragmentation, degradation of air or water quality, or intrusions upon historic settings and/or scenic values.

Comparative studies. This atlas can support comparative studies of two kinds. First, the atlas can be used to compare counties within the region. By displaying the range of values for a particular indicator or a set of indicators, the atlas can help identify specific counties where it may be desirable to take (or *avoid* taking) certain management actions because of the potential impact on the human ecosystem. Second, the atlas can be used to make comparisons with other park regions. Potential management actions can be evaluated in terms of how effective they have been for another park unit where similar regional socioeconomic factors are involved.

Social impact assessment. Federal law and NPS planning directives require that park managers assess the social impacts of potential management actions. The socioeconomic indicators displayed in this atlas can make an important contribution to such social impact assessments. For example, the maps displayed here could be used to assess impacts of various park management plans and provide context for assessments at smaller scales, such as local communities.

Collaborative decision-making. In developing general management plans, park staff are directed to "consider the park holistically … as part of the surrounding region" and to conduct planning "as part of cooperative regional planning whenever possible" (Director's Order 1998-2, par. 3.3.1.2). Tools such as this atlas can support the goal of applying a regional perspective to park planning and management. Distribution of this atlas to citizens, elected officials, educators, business and service groups, resource managers, and others can strengthen their ability to effectively participate in park management activities and decision-making. Maps that present facts in a standardized format can be particularly helpful for establishing common ground on which to decide upon management priorities, especially for decisions that affect both the park and the adjacent region.

Education and orientation. The atlas can be used to orient new park staff, as well as central office staff, to some of the basic facts about human activities in the park's region of interest. It can also serve as a tool for sharing information about socioeconomic trends with the public, gateway communities, media, and Congress.

In conclusion, effective park management requires a clear understanding of human activities in the surrounding region that can impact park resources and operations. By providing the "basic facts" about such activities, this atlas can help managers, citizens, and others better provide for the preservation and enjoyment of Harpers Ferry National Historical Park.

Appendices

Appendix 1: Data Sources for Indicators

The data sources used to obtain the measures for the socioeconomic indicators are listed below. The indicators listed on the left correspond to the titles of the maps in the atlas. The measure corresponds to the legends used in the maps and the ranked data tables.

INDICATOR	MEASURE	DATA SOURCE
General Population		
*Total Population	total number of people (2000)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/www/cen2000/tablist.html
Historical Population Change	% change in total number of people (1970-1990)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
*Recent Population Change	% change in total number of people (1990-2000)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/www/cen2000/tablist.html
*Projected Population Change	projected % change in total number of people (1998-2020)	Woods & Poole Economics, Inc. 1999 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
Elderly Population	% total population 65 years old and over (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov
Economy and Commerce		
*Industry Earnings	% total earnings by industrial category (1996)	Woods & Poole Economics, Inc. 1999 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
*Employment by Industry	% employment by industrial category (1996)	Woods & Poole Economics, Inc. 1999 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
Civilian Labor Force	% total population 16 years old and over in the civilian labor force (1996)	1) U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/www/estimates/countypop.html 2) U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
Personal Income	average personal income per capita ($) (1996)	Woods & Poole Economics, Inc. 1999 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods & Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. http://www.woodsandpoole.com
*Poverty	% total population in poverty (1997)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/hhes/www/saipe/stcty/estimate.html
Social and Cultural Characteristics		
Racial Composition	% total population that is: Hispanic or Latino, White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Some Other Race, or Two or More Races (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov
*Racial Diversity	% total population belonging to minorities (2000)	U.S. Department of Commerce, Census Bureau, http://factfinder.census.gov
*Educational Attainment	% total population 25 years old and over with some college or college degree (1990)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html

Appendix 1: Data Sources for Indicators

INDICATOR	MEASURE	DATA SOURCE
*Religious Groups	dominant religion expressed as % total church membership (1990)	Bradley, M., Green, N., Jones, D., Lynn, M., and McNeil, L. (1992). Churches and Church Membership in the United States 1990. Atlanta: Glenmary Research Center.
Crime	number of serious crimes per 100,000 people (1993)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
Recreation and Tourism		
Recreation/Tourism Establishments	% total service establishments in lodging or amusement and recreation services (1992)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
*Recreation/Tourism Revenue	% total service receipts from lodging or amusement and recreation services (1992)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
*Recreation/Tourism Employment	% employed civilian labor force in personal, entertainment, and recreation services (1990)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
Administration and Government		
*Congressional Districts	Congressional district boundaries (1990)	ESRI, Environmental Systems Research Institute, Inc., is a private firm headquartered in Redlands, California with a focus on GIS (Geographic Information Systems) software development. http://www.esri.com/data/online/tiger/index.html
*Federal Expenditures	federal expenditures per capita ($) (1998)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/prod/www/abs/cffr.html
Local Government Revenue	local government revenue per capita ($) (1997)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/govs/www/cog.html
Local Government Expenditures	local government expenditures per capita ($) (1997)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/govs/www/cog.html
Payments in Lieu of Taxes	total payments transferred to counties (1998)	U.S. Department of the Interior, Bureau of Land Management. Payment In Lieu of Taxes, Fiscal Year 1998. Washington, DC.

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
Federal Grants	% total federal expenditures received as grant awards (1998)	U.S. Department of Commerce, Census Bureau, http://www.census.gov/prod/www/abs/cffr.html
Land Use		
*Ecoregions	ecoregion division boundaries (1995)	1) USDA Forest Service, Inventory and Monitoring Institute, http://www.fs.fed.us/land/ecosysmgmt/ecoreg1_home.html 2) Bailey, Robert G. (1995). Description of the Ecoregions of the United States (2nd ed.). Misc. Pub. No. 1391, USDA Forest Service, 108 pp.
*Federal Lands	% land in federal ownership (1998)	U.S. Department of the Interior, Bureau of Land Management. Payment In Lieu of Taxes, Fiscal Year 1998. Washington, DC.
Farmland	% land classified as farmland (1997)	1) USDA National Agricultural Statistics Service. Census of Agriculture 1997, http://www.nass.usda.gov/census/ 2) U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
*Change in Farmland	% change in acres of farmland (1982-1997)	1) USDA National Agricultural Statistics Service. Census of Agriculture 1997, http://www.nass.usda.gov/census/ 2) U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.html
Domestic Water Use	gallons of water per day, per person (1995)	U.S. Department of the Interior, U.S. Geological Survey, http://water.usgs.gov/watuse/spread95.html
*Urbanization	level of urbanization (1997)	U.S. Department of Agriculture, Economic Research Service, http://usda.mannlib.cornell.edu/data-sets/rural/97002/
Change in Building Permits	average annual % change in number of building permits (1987-1997)	U.S. Department of Commerce, Census Bureau. USA Counties 1998 http://tier2.census.gov/usac/index.html
Watersheds	watershed boundaries (1998)	U.S. Department of the Interior, U.S. Geological Survey, http://www.nationalatlas.gov/atlasftp.html

** Denotes a core indicator, common to all atlases in this series. Additional indicators were selected by park managers to include information specific to their particular management needs.*

Appendix 2: Technical Notes on Map Design

Selection of Base Map Data – The regional base map used to map socioeconomic indicators on the following pages includes state and county boundaries, some of the major roads, major cities, and a few other selected cities and towns. The roads, cities, and towns are included to provide readers with a few familiar points of reference. It should be emphasized that this is not a general purpose atlas of the region, for it focuses only on socioeconomic indicators.

Choropleth Mapping – For most of the maps, data are grouped by quartiles which vary in shading from light to dark (for low to high values). This shading technique, known as choropleth mapping, is usually applied to ratio data; population density, infant deaths per 1,000 live births, and median income are examples. Maps that display total amounts (such as total population) often use other approaches, such as proportional symbols. For clarity, ease of use, and consistent design, choropleth mapping is used for most of the social indicator data.

Quartile Classification – The choice of a *quartile* classification of the data means that for most maps, counties were divided into four classes. Rather than focusing on the actual numerical value of the indicator for each county, the quartile approach emphasizes the variation in data values among counties. The legend accompanying the map allows the reader to see the actual magnitude of variation among the counties for that indicator. Quartiles make it easy for the reader to make intuitive comparisons among counties; the darkest shaded counties are in the "top quarter," the lightest shaded counties are in the "bottom quarter," and so forth. Quartiles also facilitate comparisons between maps in the atlas ("this county ranks in the bottom quartile on all three of these indicators").

Two notes: (1) For Harpers Ferry NHP, where four counties comprise the region of interest, the result (in most cases) is one county per class. (2) Counties with identical data values are grouped in the same quartile, even if this results in quartiles of unequal size.

Map Sources – The context map at the beginning of the atlas was generated from Cartesia Software, 1998, MapArt Geopolitical Deluxe – USA (Lambertville, NJ; http://www.mapresources.com). The standard region map used throughout the atlas was generated from U.S. Census Bureau shapefiles. Contextual information (roads and cities) was obtained from the U.S. Geological Survey (http://www.nationalatlas.gov).

Production – Indicator data for the atlas were compiled in Microsoft Excel 98. These were linked to U.S. Census shapefiles using ArcView GIS 3.1. The GIS files were imported into Adobe Illustrator 8.0, with the Avenza MAPublisher 3.5 plug-in, for final map design. Text was prepared in Microsoft Word 98. The final atlas layout (text, maps, graphics) was completed using Adobe PageMaker 6.5.

Appendix 3: Technical Notes on Measurement of Selected Indicators

[1] Economic activity is categorized as belonging to one of four **industry categories**: agriculture/natural resources, construction/manufacturing, sales/services, and government. Individual workers, regardless of their specific job responsibilities, are classified according to the category their overall company or organization belongs to. Thus, while accounting is considered a "service" activity, an accountant for a mining company would be counted as working in "agriculture/natural resources." "Government" includes all federal government workers and all state/local employees, such as teachers, police, firefighters, etc. Even though government jobs may involve construction, natural resource management, or provision of services, they are still counted as belonging to the "government" category.

[2] See note above on industry categories.

[3] Also included in the **civilian labor force** are those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. All persons on active duty in the U.S. Armed Forces, people whose only activity consisted of work around the house or unpaid volunteer work for religious, charitable, and similar organizations are excluded from the civilian labor force.

[4] **Personal income** is measured as the average per capita income. This is obtained by dividing the total personal income of county residents by the total population of the county.

[5] **Poverty** is measured as the percentage of the total population living below the poverty level (1997). The poverty level is defined as earnings of $16,400 or less for a family of four persons. Poverty thresholds are applied on a national basis and are not adjusted for regional, state, or local variations in the cost of living.

[6] **Racial composition** is based upon self-identification by people responding to the U.S. Census; it does not denote any clear-cut scientific definition of biological stock. Census respondents are asked to classify themselves according to the race with which they most closely identify. Specific responses such as "Polish," "Haitian," "Thai," or "Lakota" were coded more generally as belonging to one of six general categories (White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and Some Other Race respectively). Respondents to the 2000 Census were also offered the option of identifying themselves as belonging to Two or More Races (this refers to a combination of two or more of the racial categories listed above). Persons of Hispanic or Latino origin may be of any race.

[7] **Racial diversity** is defined for this measure as the percentage of the population that classifies itself as being non-White. Diversity by this definition does not necessarily measure the degree of "variety" in the population. For example, a hypothetical county with a 90% Asian population would be considered as being more "diverse" than a county in which

each of the six major ethnic groups constituted 10% of the population (in the latter case, diversity would be measured as 60%). The Hispanic or Latino origin category was not included in this measure because persons of Hispanic or Latino origin may be of any race (including White).

[8] **Recreation/Tourism**, part of the broader sector of sales/services, includes a wide range of business establishments that fall within three general categories: 1) hotels, rooming houses, camps, and other lodging (ranging from hotels to campsites); 2) personal services involving the care of one's personal appearance or apparel (such as photographic studios, beauty shops, health clubs, and other miscellaneous services, such as funeral parlors and tax preparation services); and 3) amusement and recreation services, such as movie theatres, video rental, museums, bowling alleys, and casinos.

[9] See note above on recreation/tourism.

[10] See note above on recreation/tourism.

[11] **Federal expenditures** include expenditures, or obligation for, direct payments for individuals, procurement, grants, salaries and wages, direct loans, and guaranteed loans and insurance. Grant awards are reported by county of the initial recipient; thus if the initial recipient is the state government, the county in which the state capital is located is reported as having "received' that "pass-through" grant, even though the monies are subsequently distributed to other local governments.

[12] For **federal grants** administered through state governments, the recipient county is the county where the state capital is located.

[13] **Federal lands** include all tax-exempt federal lands administered by the Bureau of Land Management (BLM), the National Park Service, the U.S. Fish and Wildlife Service, the U.S. Forest Service, federal water projects, and some military installations. The BLM calculates the amount of federal land within counties in order to administer the federal government's payments-in-lieu-of-taxes (PILT) program.

[14] **Farmland** consists primarily of agricultural land used for crops, pasture, or grazing. It also includes woodland and wasteland that is part of a farm operator's total operation.

[15] See note above on farmland.

[16] The Economic Research Service classifies counties according to their level of **urbanization**. The classification consists of nine mutually-exclusive codes:

METROPOLITAN COUNTIES

1) Counties in large metropolitan areas of 1 million or more residents
2) Counties in small metropolitan areas of less than 1 million residents

NONMETROPOLITAN COUNTIES

Adjacent to a large metro area and

3) contains all or part of its own city of 10,000 or more residents

4) does not contain any part of a city of 10,000 or more residents

Adjacent to a small metro area and

5) contains all or part of its own city of 10,000 or more residents
6) does not contain any part of a city of 10,000 or more residents

Not adjacent to a metro area and

7) contains all or part of its own city of 10,000 or more residents
8) contains all or part of its own town of 2,500 to 9,999 residents
9) totally rural, does not contain any part of a town of 2,500 or more residents

[17] The issuing of **building permits** for privately-owned housing units does not necessarily imply that a community is growing, since any community will experience an ongoing replacement of aging houses and buildings. Also, a catastrophic event such as a major storm or fire can generate a short-term surge in the number of building permits issued. Thus a better indicator of growth is the average annual change in the number of building permits issued over a ten-year period. Changes in local codes or enforcement can also affect the number of building permits issued. This measure includes data about new housing units intended for occupancy and maintained by the occupants. It excludes hotels, motels, and group residential structures such as nursing homes and college dormitories. All public housing and nonresidential buildings are also excluded.

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