A Socioeconomic Atlas for

Joshua Tree National Park and its Region

2001

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by

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Acknowledgments

We would like to express our appreciation to the staff of Joshua Tree National Park, especially Ernest Quintana and Mary Risser, for their continued enthusiasm and support throughout this pilot project. Nina Chambers was instrumental in developing the project: she obtained data, organized and calculated data sets, and compiled other needed information. Brendan Clarke prepared and carried out the initial design of the base maps. He also helped compute data sets and did much of the initial GIS work.

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 Harpers Ferry National Historical 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 Joshua Tree National 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 Joshua Tree National 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 Joshua Tree National 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 relevant 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. Joshua Tree NP 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 that provide additional information on the measurement of selected indicators.

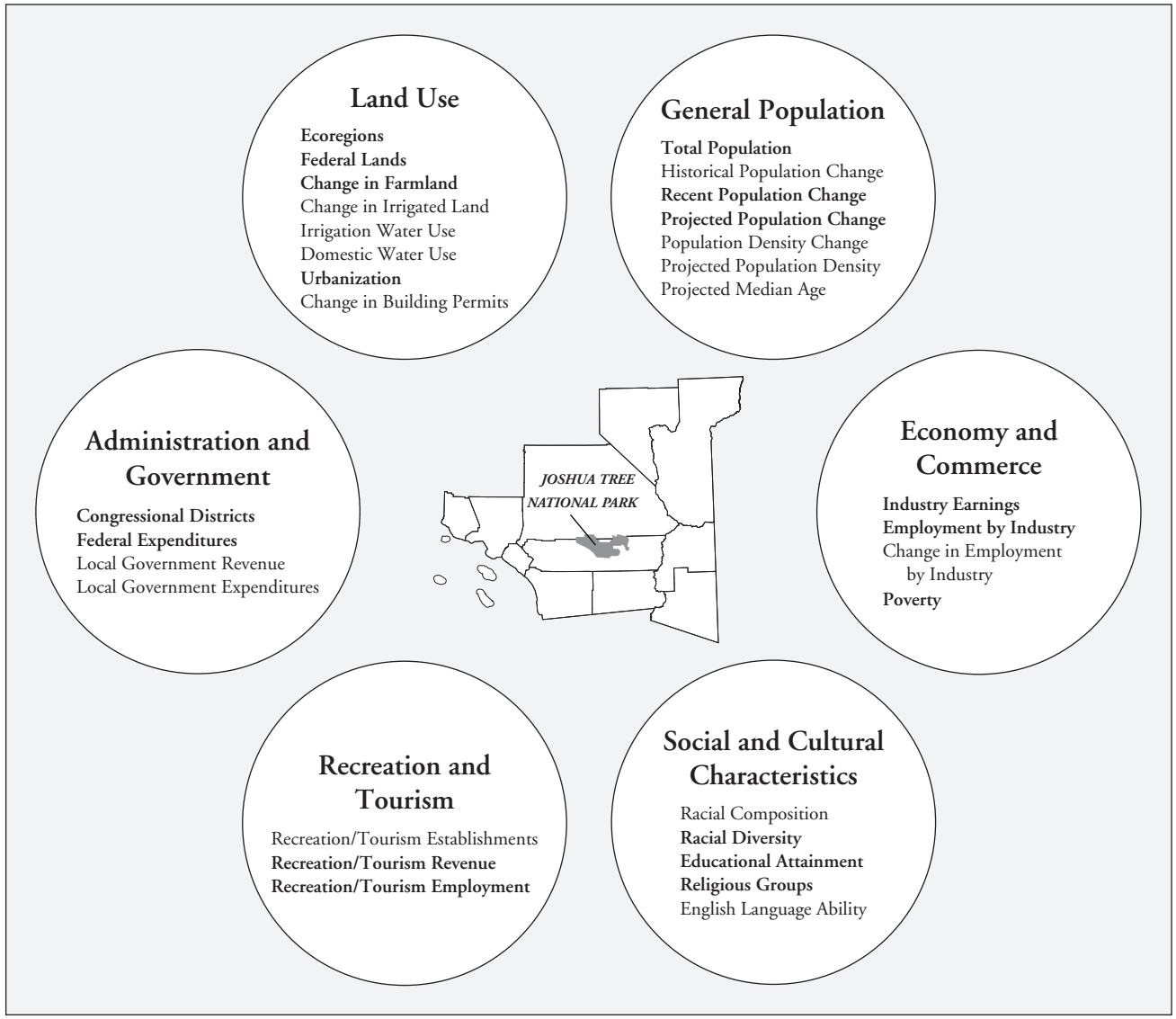


Figure 1. Indicators Included in this Atlas **core indicator** additional indicator

The Region

In selecting the boundaries of the region of interest covered by this atlas, Joshua Tree NP 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 four California coastal counties (Ventura, Los Angeles, Orange, and San Diego), three California interior counties (San Bernardino, Riverside, and Imperial), Arizona's three western counties (Mohave, La Paz, and Yuma), and Nevada's southernmost county (Clark). The map on the facing page depicts the region in its larger context.

Joshua Tree National Park is located in southern California, 140 miles east of Los Angeles, 110 miles northeast of San Diego, and 160 miles south of Las Vegas, Nevada. The Joshua Tree NP region is characterized by great diversity in its landscape and people. The region's arid climate makes water a critical resource. Vast water transportation systems support large metropolitan areas and intensive irrigation-based agriculture. Year-round warmth and diverse topography make the region a recreation and retirement destination as well.

Ecologically, portions of the region near the Pacific coast have a Mediterranean climate, which supports a variety of forest and shrub communities that can withstand dry seasons of 2 - 4 months in length. Inland from the coast, bands of mountains, generally ranging between 2,000 and 8,000 feet in elevation, block precipitation from the interior of the region. Most of the interior is classified as part of the American Desert, which encompasses the Sonoran, Mojave, and Colorado deserts. Throughout the region, local variations in elevation as well as direction of slope are important factors in determining which plant and animal communities will thrive.

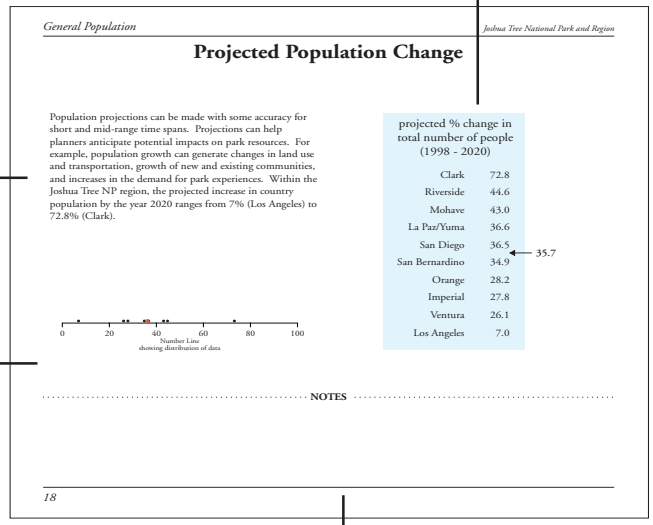
The coast contains the densely populated metropolitan areas of Los Angeles and San Diego, which have diverse economies dominated by the service sector. Inland from the coast, vast areas are sparsely settled. Here, communities tend to be concentrated around interstate highway corridors, resort and retirement destinations, and military bases. Further inland, Las Vegas, Nevada and other growing cities and towns such as Yuma, Arizona rely on power and water from hydroelectric and irrigation projects on the Colorado River. On the south side of the region, the Imperial Valley is an important year-round supplier of agricultural produce to markets throughout the United States. In addition to Joshua Tree NP, the region contains all or part of several national park units, including Cabrillo NM, Channel Islands NP, Death Valley NP, Grand Canyon NP, Lake Mead NRA, Mojave N PRES, and Santa Monica Mountains NRA.

Joshua Tree National Park and its Region

Using the Socioeconomic Indicators and Maps

The socioeconomic indicators for the Joshua Tree National 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.



General Population *Joshua Tree National Park and Region*

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 Joshua Tree NP region, the projected increase in country population by the year 2020 ranges from 7% (Los Angeles) to 72.8% (Clark).

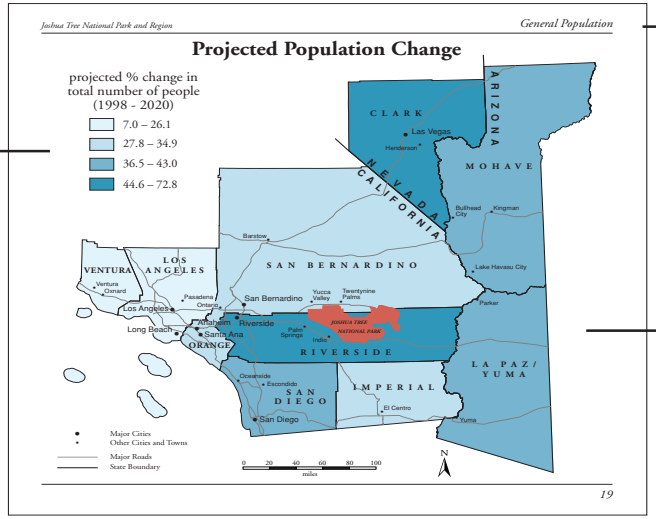
projected % change in total number of people (1998 - 2020)	
Clark	72.8
Riverside	44.6
Mohave	43.0
La Paz/Yuma	36.6
San Diego	36.5
San Bernardino	34.9
Orange	28.2
Imperial	27.8
Ventura	26.1
Los Angeles	7.0

35.7

0 20 40 60 80 100
Number Line showing distribution of data

NOTES

18



Joshua Tree National Park and Region *General Population*

Projected Population Change

projected % change in total number of people (1998 - 2020)
7.0 – 26.1
27.8 – 34.9
36.5 – 43.0
44.6 – 72.8

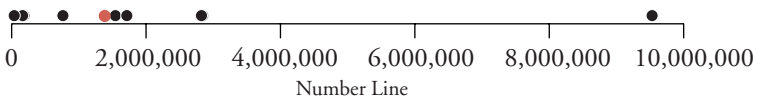
19

- 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 Joshua Tree NP region, county population (2000) ranges from 19,715 (La Paz) to 9,519,338 (Los Angeles).



Number Line
showing distribution of data

total number of people (2000)	
Los Angeles	9,519,338
Orange	2,846,289
San Diego	2,813,833
San Bernadino	1,709,434
Riverside	1,545,387
Clark	**1,375,765**
Ventura	753,197
Yuma	160,026
Mohave	155,032
Imperial	142,361
La Paz	19,715

NOTES

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 Joshua Tree NP region, county growth rates (1970-1990) ranged from 25.9% (Los Angeles) to 261.6% (Mohave).

Number Line
showing distribution of data

% change in total number of people (1970 - 1990)	
Mohave	261.6
Clark	171.3
Riverside	156.2
San Bernardino	107.9
La Paz/Yuma	95.5
San Diego	84.0
Ventura	76.8
Orange	69.6
Imperial	46.7
Los Angeles	25.9

89.8

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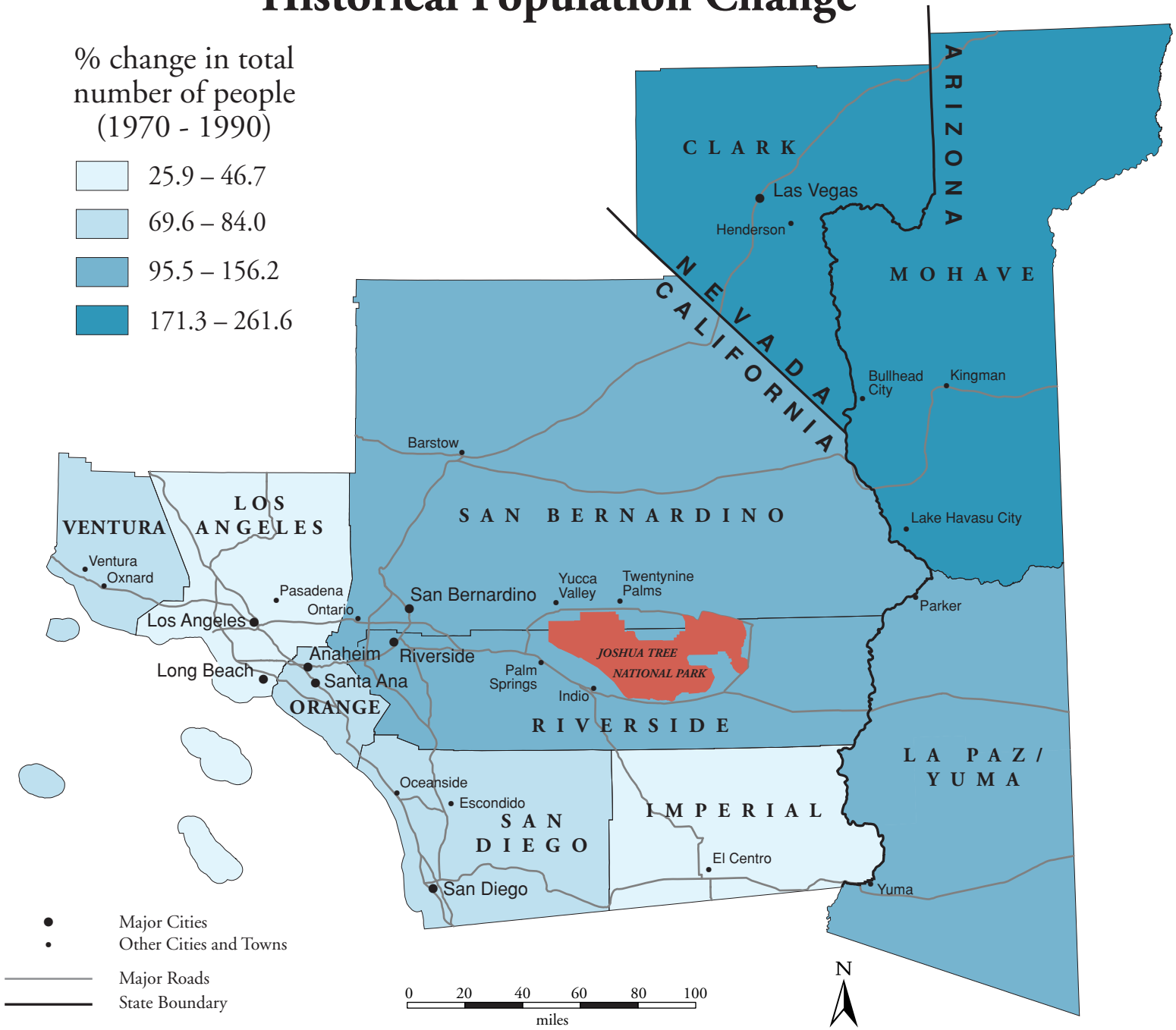
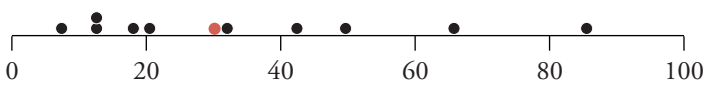
Historical Population Change



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 Joshua Tree NP region, the recent increase in county population (1990-2000) ranges from 7.4% (Los Angeles) to 85.6% (Clark).



Number Line
showing distribution of data

% change in total number of people (1990 - 2000)	
Clark	85.6
Mohave	65.8
Yuma	49.7
La Paz	42.4
Riverside	32.0
Imperial	**30.2**
San Bernadino	20.5
Orange	18.1
San Diego	12.6
Ventura	12.6
Los Angeles	7.4

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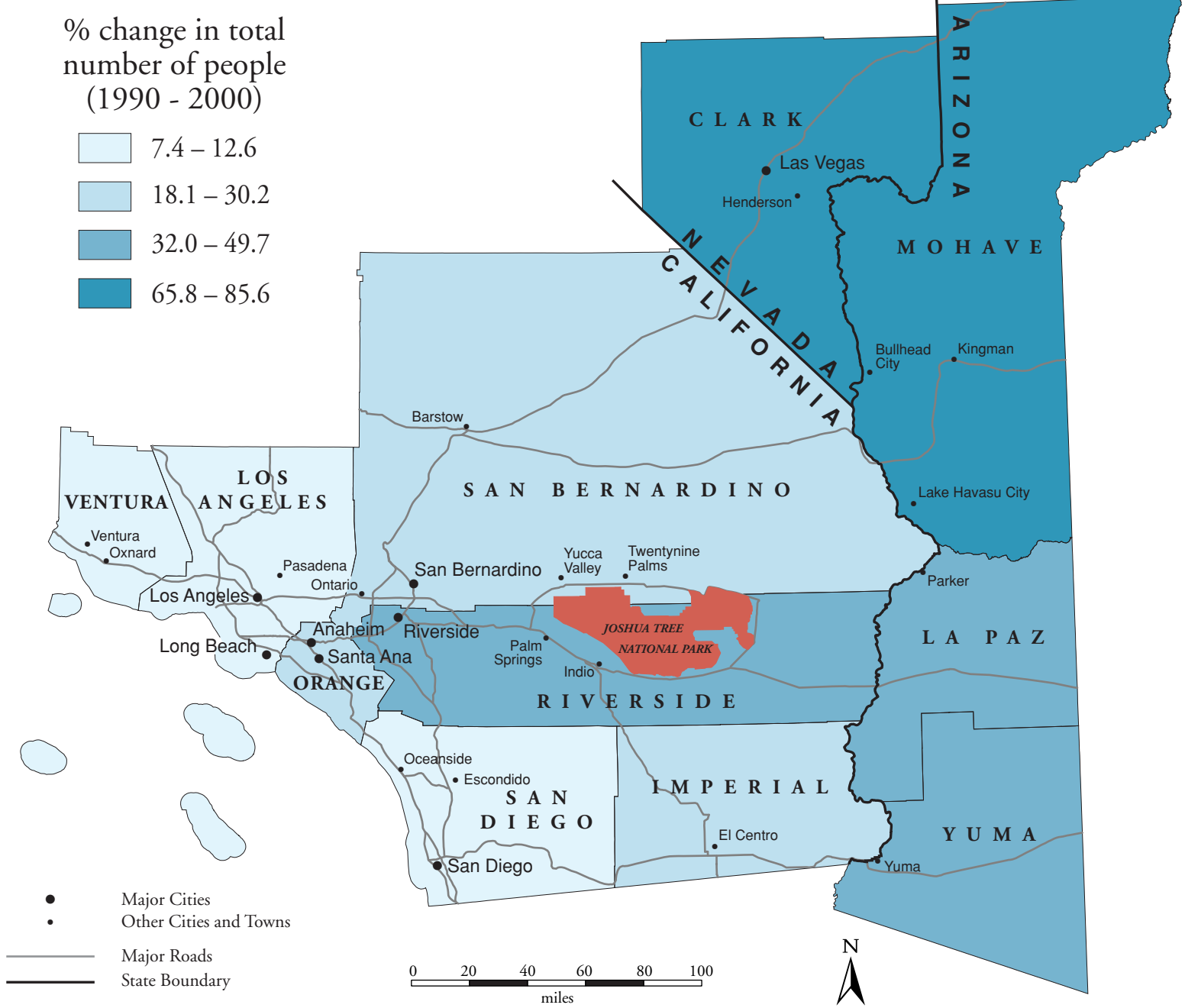
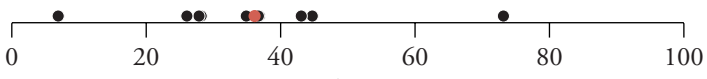
Recent Population Change



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 Joshua Tree NP region, the projected increase in county population by the year 2020 ranges from 7% (Los Angeles) to 72.8% (Clark).



Number Line
showing distribution of data

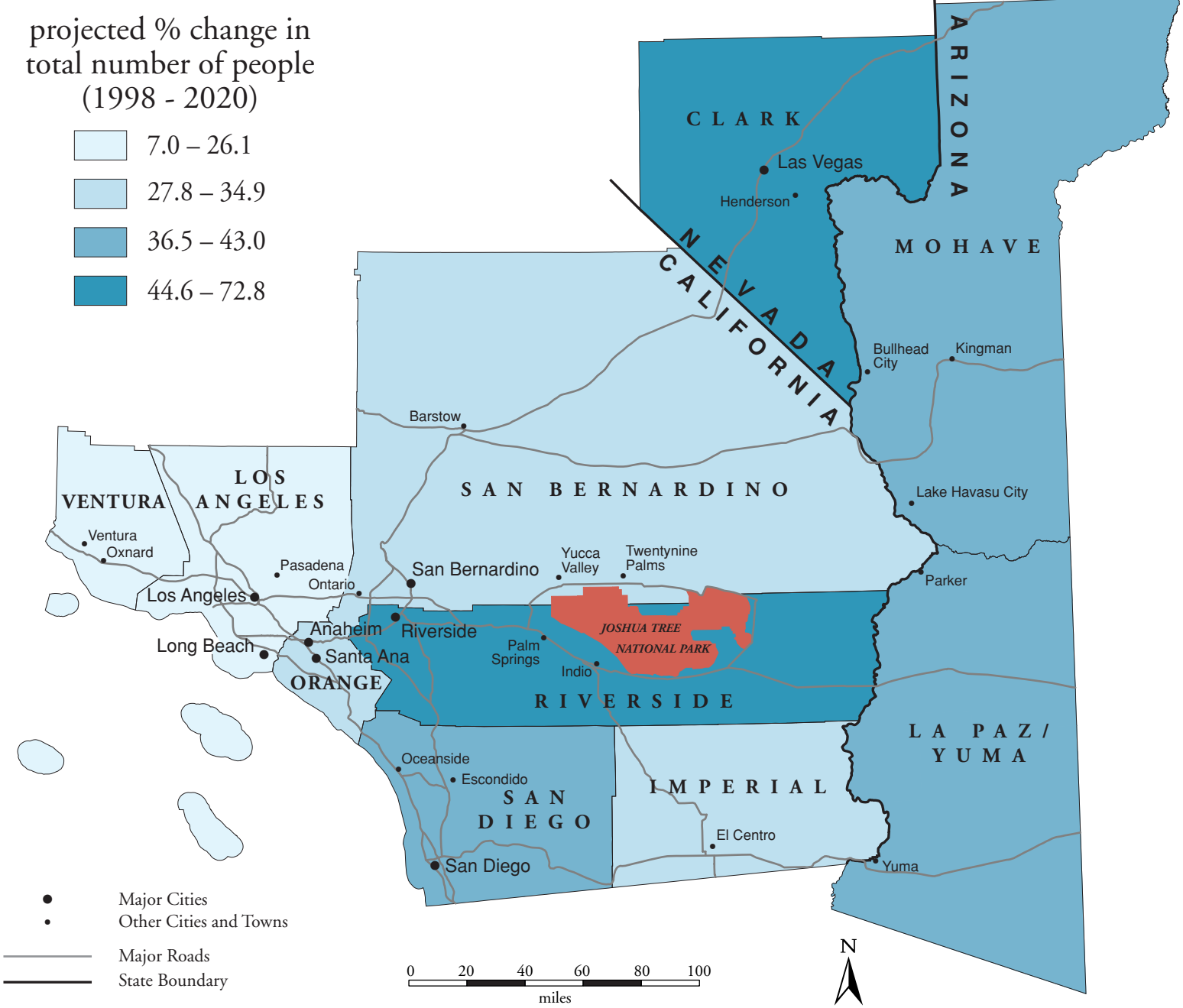
projected % change in total number of people (1998 - 2020)

Clark	72.8
Riverside	44.6
Mohave	43.0
La Paz/Yuma	36.6
San Diego	36.5
San Bernardino	34.9
Orange	28.2
Imperial	27.8
Ventura	26.1
Los Angeles	7.0

35.7

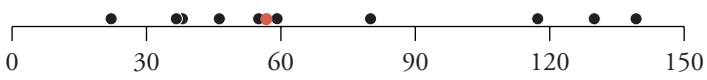
NOTES

Projected Population Change



Population Density Change

Population density change is an alternate means of stating the rate of population growth or decline. Population density change depicted here over a mid-range period of time (1980-1997) can be compared with recent population change (1990-2000), as depicted on pages 16 - 17, to determine whether the rate of change has remained steady, decreased, or increased in recent years. Steady or decelerating population growth can allow government and institutions to anticipate and plan for needs in advance. Accelerating population growth can place stress on government and institutions, which must to respond rapidly to changes in civic life, industry, infrastructure, and the use of land and resources. Within the Joshua Tree NP region, the change in county population density (1980-1997) ranges from 21.9% (Los Angles) to 139% (Clark).[1]



Number Line
showing distribution of data

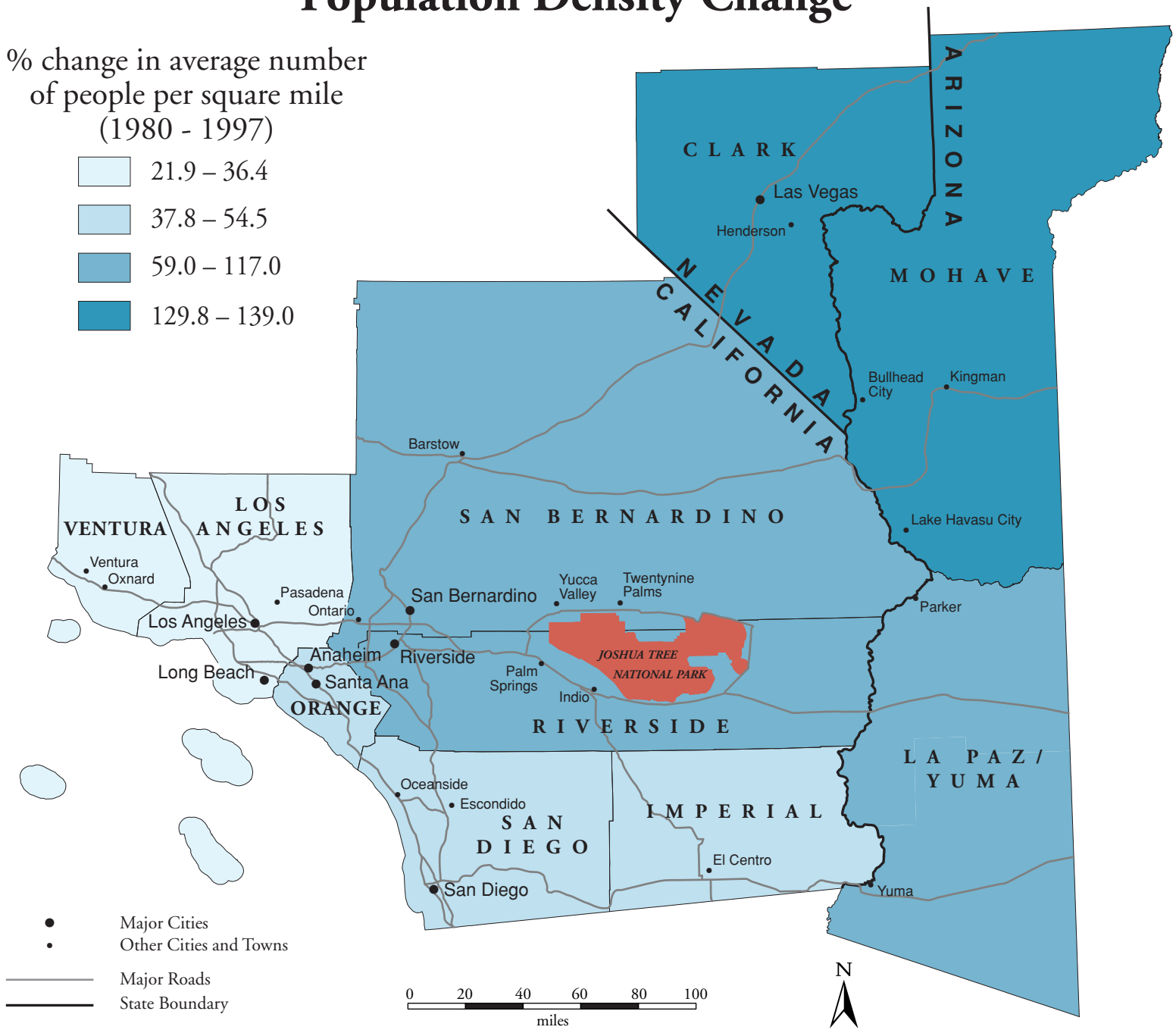
% change in average number of people per square mile (1980 - 1997)

Clark	139.0
Mohave	129.8
Riverside	117.0
San Bernardino	79.7
La Paz/Yuma	59.0
Imperial	54.5
San Diego	46.3
Orange	37.8
Ventura	36.4
Los Angeles	21.9

56.8

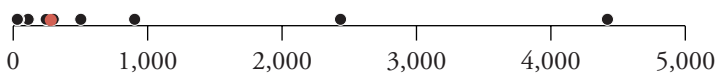
NOTES

Population Density Change



Projected Population Density

Population density projections are based on population projections. Future regional variations in county population density suggest variations in how counties will approach decisions about natural resource-related issues such as transportation, zoning, and water supply. Significantly increased population density can generate rising land costs as well as increased demand for open space to be used for recreation or conservation. Within the Joshua Tree NP region, projected county population density (2020) ranges from 14.1 people per square mile (Mohave) to 4,399 people per square mile (Orange).[2]



Number Line
showing distribution of data

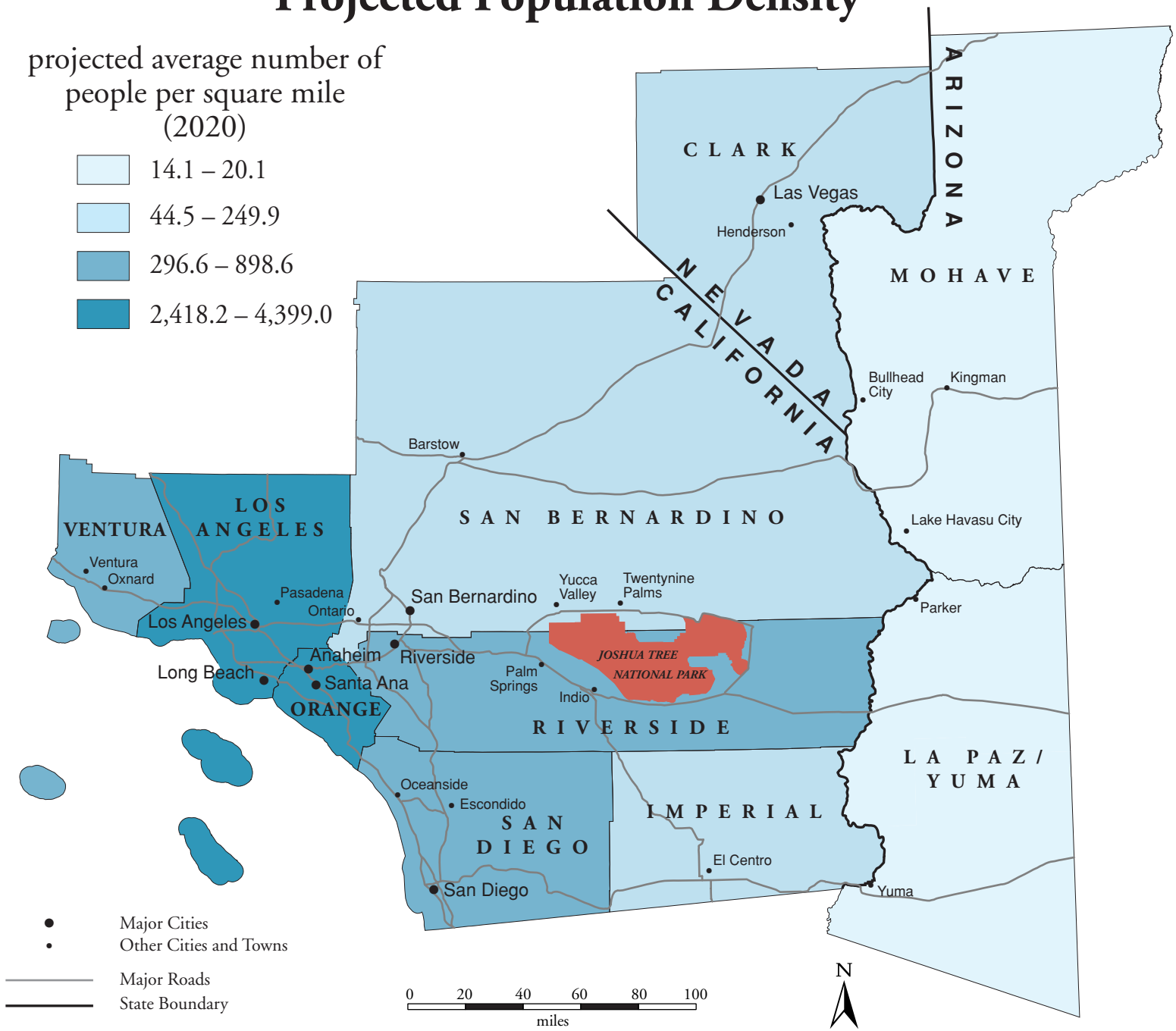
projected average number of people per square mile (2020)

Orange	4,399.0
Los Angeles	2,418.2
San Diego	898.6
Ventura	502.0
Riverside	296.6
Clark	249.9
San Bernardino	110.5
Imperial	44.5
La Paz/Yuma	20.1
Mohave	14.1

273.3

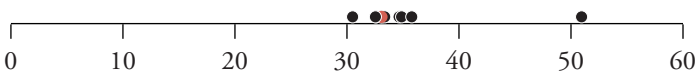
NOTES

Projected Population Density



Projected Median Age

Median age expresses the age of a "typical" county resident for whom half the population is older and half is younger. Just as age is an important influence on individual behavior, the median age of a county's population can influence its character in many ways. For example, a relatively young county population might place a higher priority on schools, while a relatively old county population might place a higher priority on health care. Within the Joshua Tree NP region, projections for median age in the year 2020 range from 30.7 (San Bernardino) to 51 (Mohave).



Number Line
showing distribution of data

projected median age of total population (2020)

Mohave	51.0
Clark	35.8
Imperial	34.8
Ventura	34.7
Orange	33.3
Riverside	33.1
San Diego	33.0
Los Angeles	32.6
La Paz/Yuma	32.5
San Bernardino	30.7

33.2

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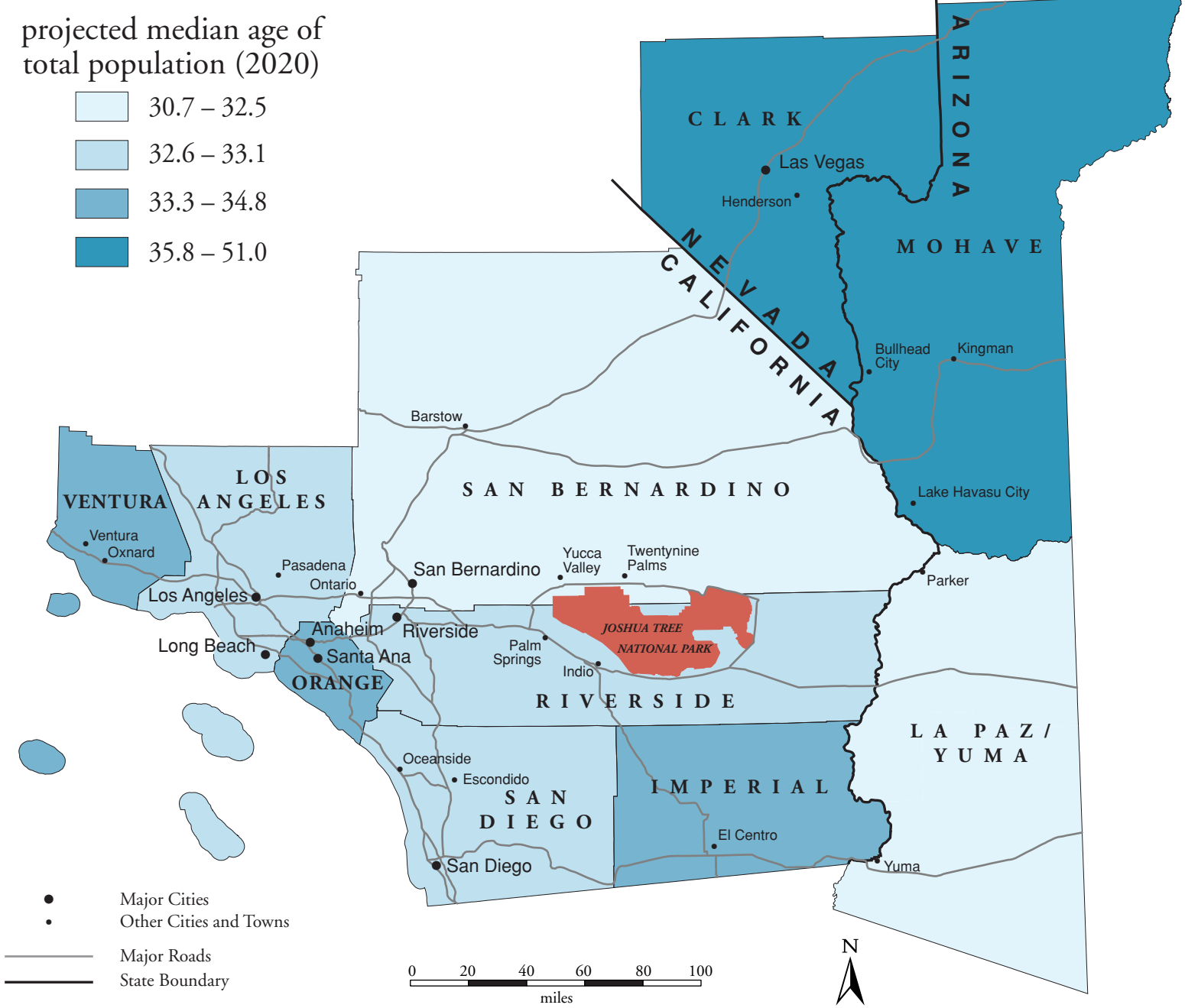
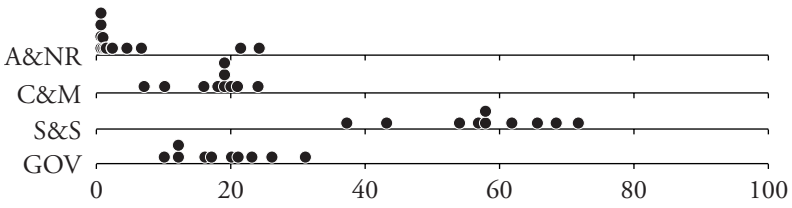
Projected Median Age



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 Joshua Tree NP region, the leading sector of earnings in each county (1996) is sales/services, and the second-ranking sector varies from county to county.[3]



Number Line
showing distribution of data

% total earnings
by industrial category (1996)

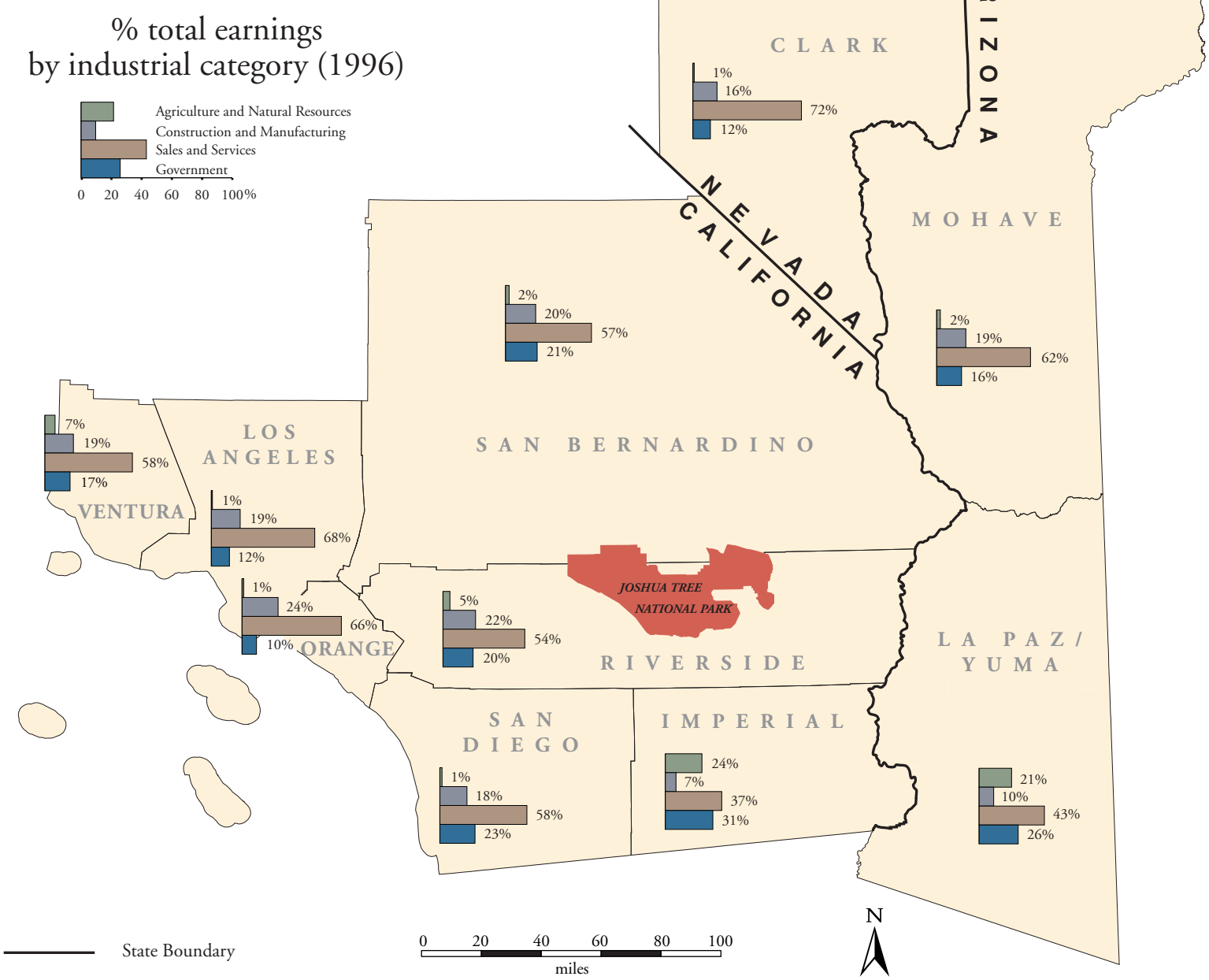
	A&NR	C&M	S&S	GOV
Clark	1	16	72	12
Imperial	24	7	37	31
La Paz/Yuma	21	10	43	26
Los Angeles	1	19	68	12
Mohave	2	19	62	16
Orange	1	24	66	10
Riverside	5	21	54	20
San Bernardino	2	20	57	21
San Diego	1	18	58	23
Ventura	7	19	58	17

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.

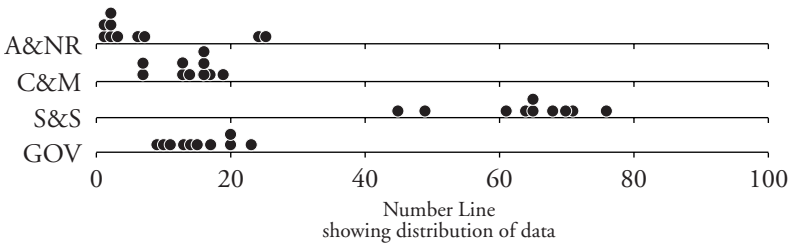
NOTES

Industry Earnings



Employment by Industry

One indicator of the way a particular county's job market is structured is the percent of workers employed in each of the four major industrial sectors. This employment distribution 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 Joshua Tree NP region, the leading sector of employment in every county (1996) is sales/services, and the second-ranking sector varies from county to county.[4]



% employment
by industrial category (1996)

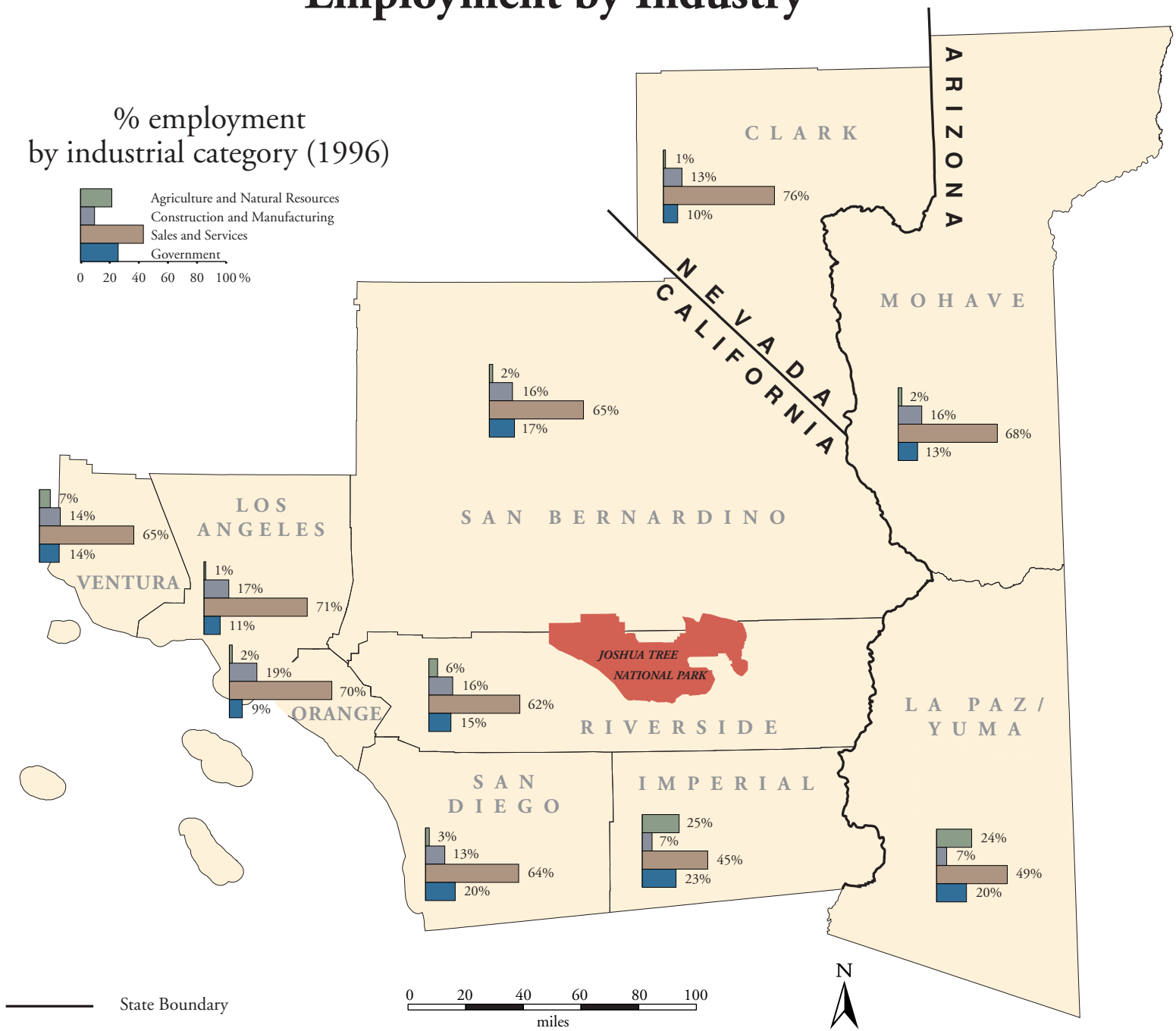
	A&NR	C&M	S&S	GOV
Clark	1	13	76	10
Imperial	25	7	45	23
La Paz/Yuma	24	7	49	20
Los Angeles	1	17	71	11
Mohave	2	16	68	13
Orange	2	19	70	9
Riverside	6	16	62	15
San Bernardino	2	16	65	17
San Diego	3	13	64	20
Ventura	7	14	65	14

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.

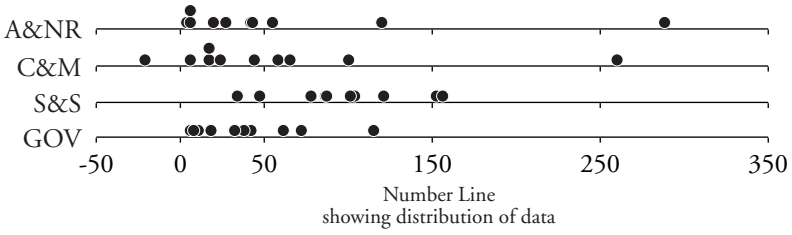
NOTES

Employment by Industry



Change in Employment by Industry

Jobs are of critical importance to individuals, families, and communities. Change in the proportion of people employed by various industries within an economy can create a cascading set of impacts. A declining industry's displacement of workers whose skills are in less demand can generate stress among households and communities. A growing industry's demand for new sets of skills can influence migration patterns and educational priorities. Local and regional political decisions, including those that impact park management goals, often place priority on protecting existing jobs or attracting new employment opportunities. Within the Joshua Tree NP region (1980-1996), counties varied not only in the relative rates of growth for each industry sector but also in the overall pace of employment growth.[5]



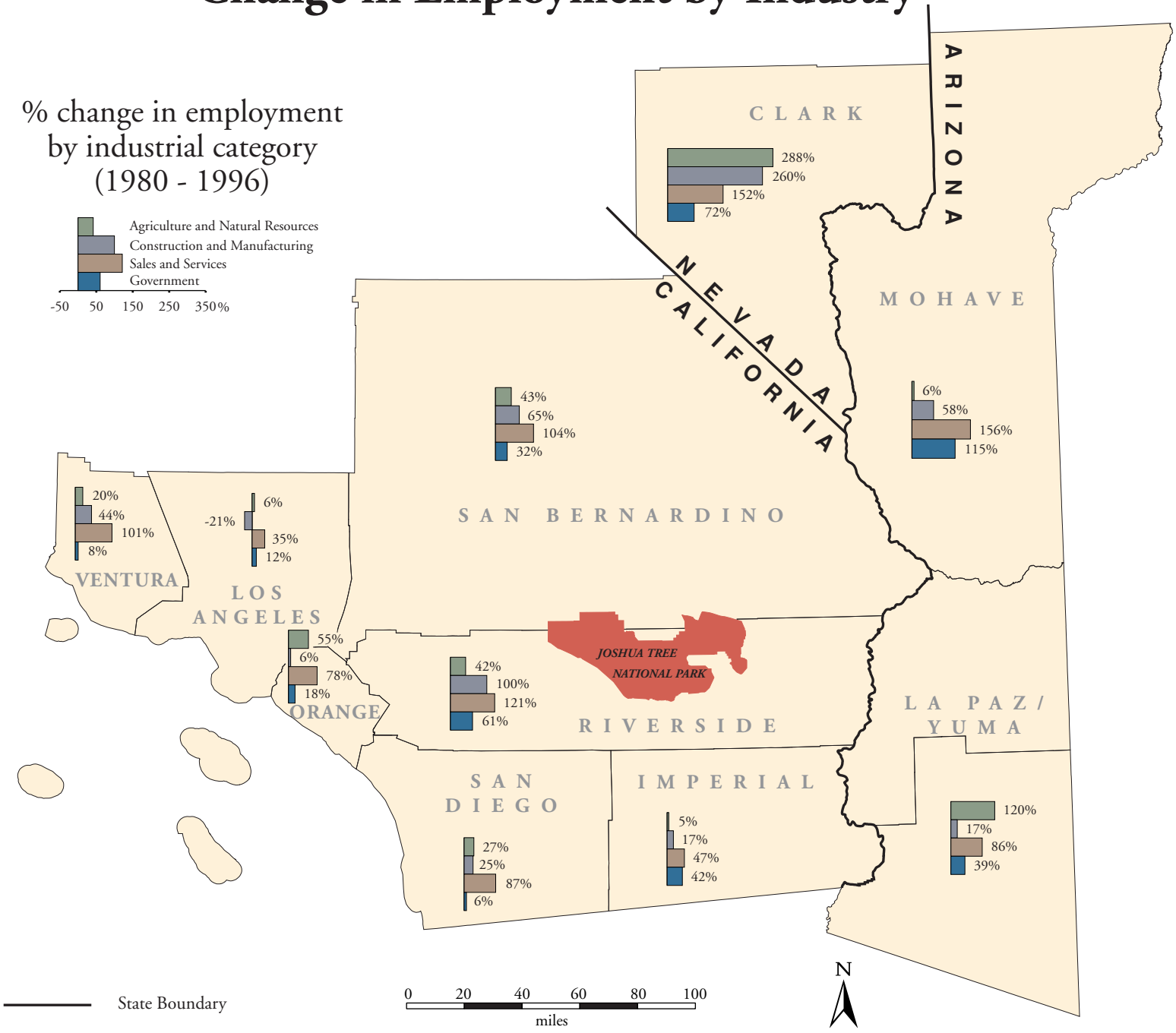
% change in employment
by industrial category
(1980 - 1996)

	A&NR	C&M	S&S	GOV
Clark	288	260	152	72
Imperial	5	17	47	42
La Paz/Yuma	120	17	86	39
Los Angeles	6	-21	35	11
Mohave	6	58	156	115
Orange	55	6	78	18
Riverside	42	100	121	61
San Bernardino	43	65	104	32
San Diego	27	25	87	6
Ventura	20	44	101	8

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

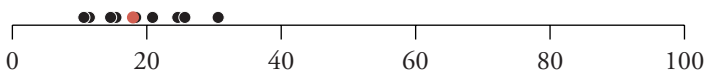
NOTES

Change in Employment by Industry



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 percent 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 Joshua Tree NP region, the level of poverty (1997) ranges from 10.3% (Ventura) to 30.3% (Imperial).[6]

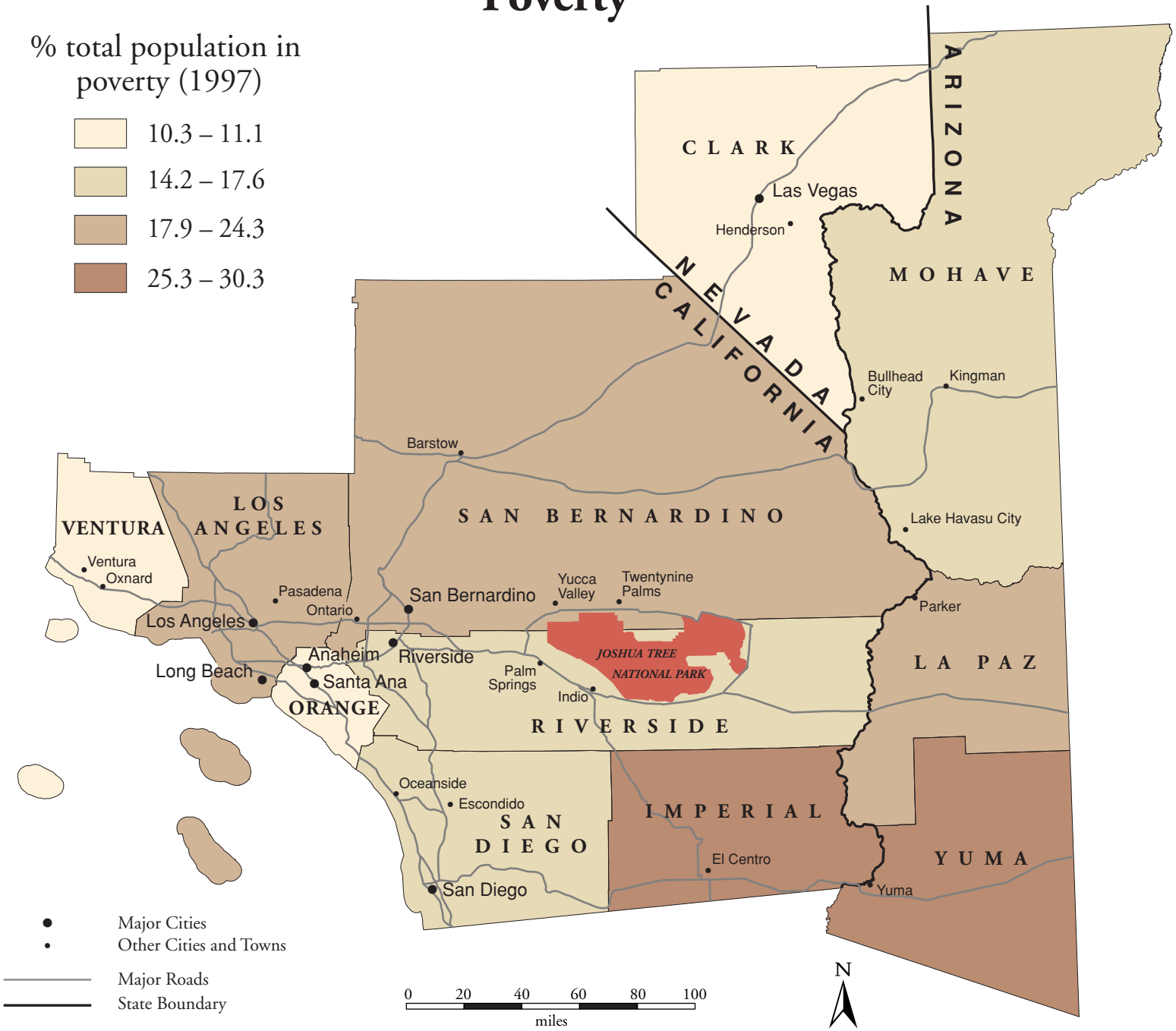


Number Line
showing distribution of data

% total population in poverty (1997)	
Imperial	30.3
Yuma	25.3
La Paz	24.3
Los Angeles	20.5
San Bernardino	17.9
Mohave	**17.6**
Riverside	15.0
San Diego	14.2
Clark	11.1
Orange	11.0
Ventura	10.3

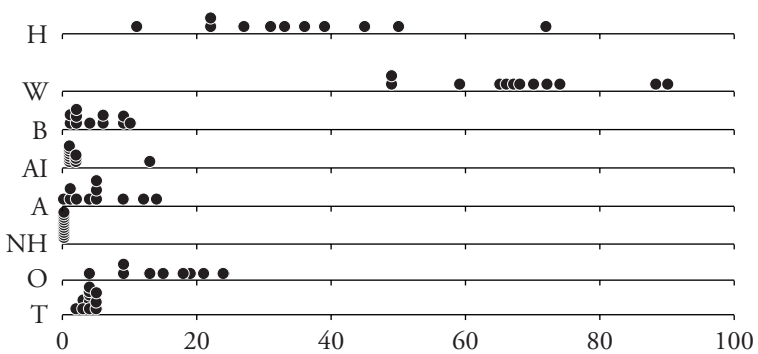
NOTES

Poverty


% total population in poverty (1997)
10.3 – 11.1
14.2 – 17.6
17.9 – 24.3
25.3 – 30.3
CLARK
Las Vegas
Henderson
ARIZONA
MOHAVE
NEVADA
CALIFORNIA
Bullhead City
Kingman
Barstow
SAN BERNARDINO
Lake Havasu City
VENTURA
LOS ANGELES
Ventura
Oxnard
Pasadena
Ontario
San Bernardino
Yucca Valley
Twentynine Palms
Parker
Los Angeles
Anaheim
Riverside
Long Beach
Santa Ana
Palm Springs
JOSHUA TREE NATIONAL PARK
Indio
LA PAZ
ORANGE
RIVERSIDE
Oceanside
Escondido
SAN DIEGO
IMPERIAL
El Centro
YUMA
San Diego
Yuma
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 20 40 60 80 100
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 Joshua Tree NP region (2000), whites constitute the largest racial group in all of the eleven counties. Imperial county has the largest percentage of persons of Hispanic/Latino origin.[7]



Number Line
showing distribution of data

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

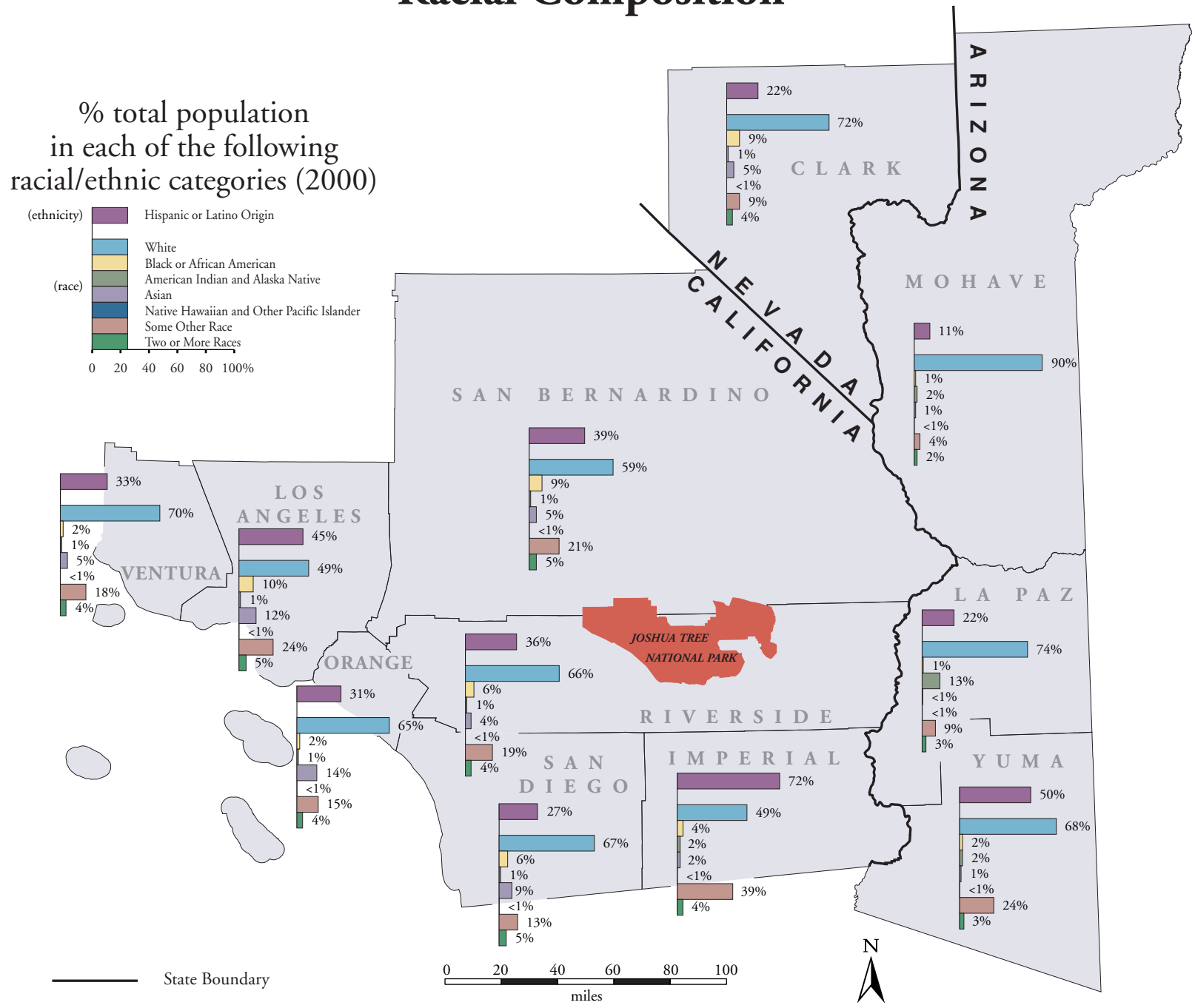
	H	W	B	AI	A	NH	O	T
Clark	22	72	9	1	5	0	9	4
Imperial	72	49	4	2	2	0	39	4
La Paz	22	74	1	13	0	0	9	3
Los Angeles	45	49	10	1	12	0	24	5
Mohave	11	90	1	2	1	0	4	2
Orange	31	65	2	1	14	0	15	4
Riverside	36	66	6	1	4	0	19	4
San Bernardino	39	59	9	1	5	0	21	5
San Diego	27	67	6	1	9	0	13	5
Ventura	33	70	2	1	5	0	18	4
Yuma	50	68	2	2	1	0	24	3

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.

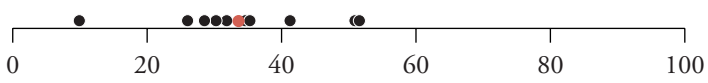
NOTES

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 Joshua Tree NP region, the percent of minorities (2000) ranges from 9.9% (Mohave) to 51.3% (Los Angeles).[8]

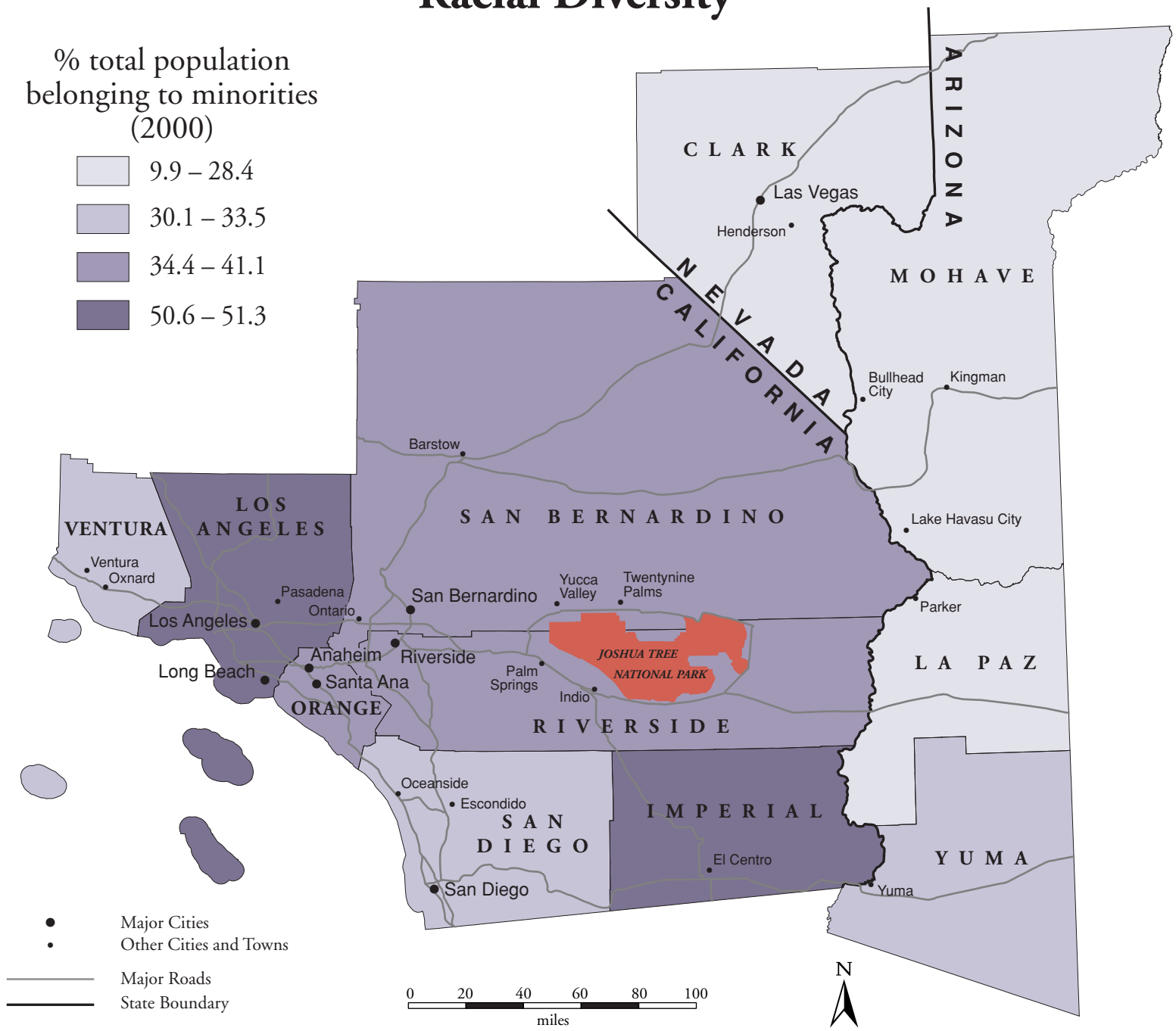


Number Line
showing distribution of data

% total population belonging to minorities (2000)	
Los Angeles	51.3
Imperial	50.6
San Bernadino	41.1
Orange	35.2
Riverside	34.4
San Diego	**33.5**
Yuma	31.7
Ventura	30.1
Clark	28.4
La Paz	25.9
Mohave	9.9

NOTES

Racial Diversity



Educational Attainment

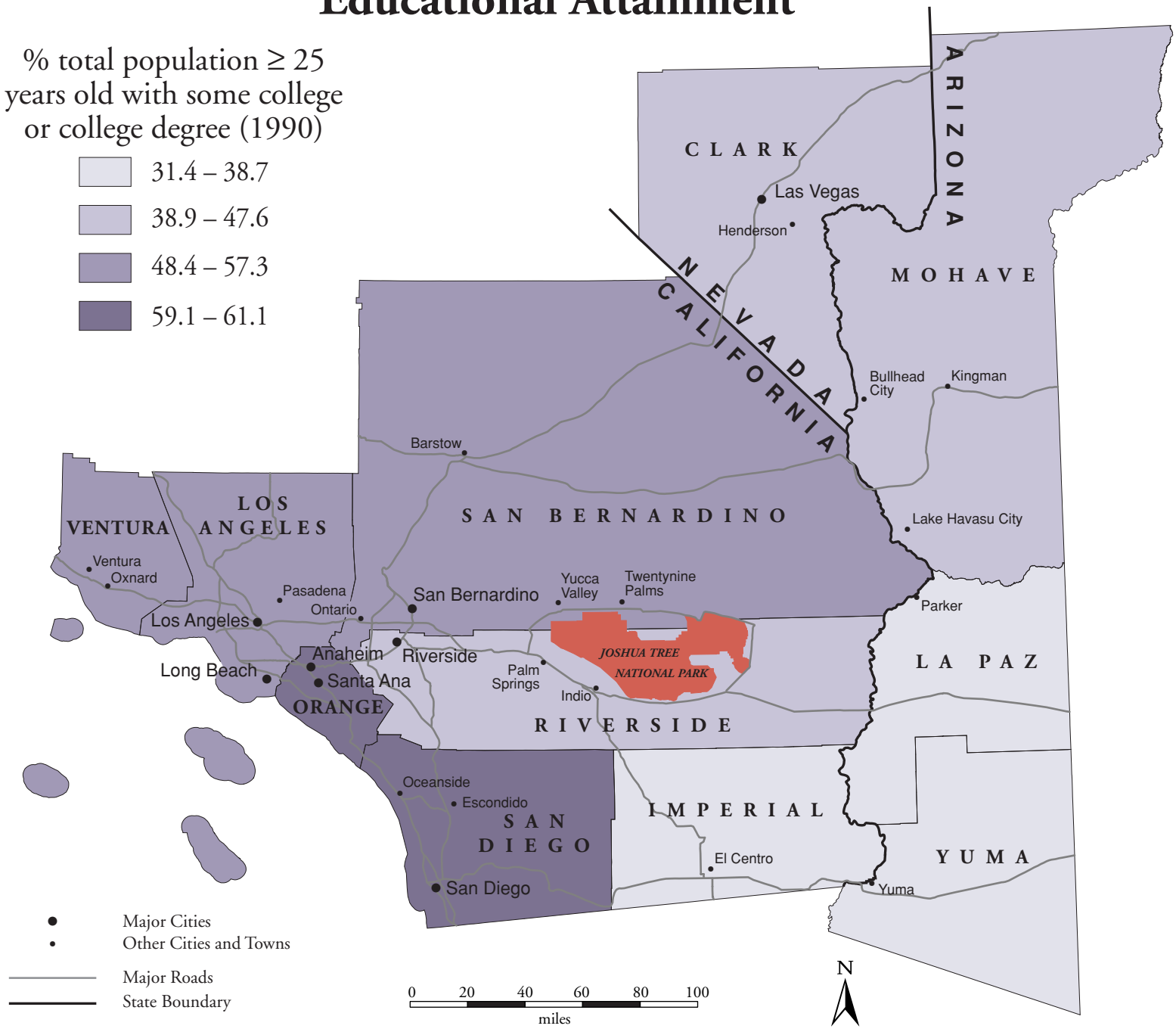
Educational attainment indicators measure the average amount of formal education that a county's residents have received. One indicator of educational attainment is the percent of adults who have attended or graduated from college. Educational attainment influences many aspects of life, such as how much 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 Joshua Tree NP region, the percent of adults with some college education (1990) ranges from 31.4% (La Paz) to 61.1% (Orange).

Number Line
showing distribution of data

% total population ≥ 25 years old with some college or college degree (1990)	
Orange	61.1
San Diego	59.1
Ventura	57.3
Los Angeles	49.3
San Bernardino	48.4
Riverside	**47.6**
Clark	45.3
Mohave	38.9
Yuma	38.7
Imperial	33.1
La Paz	31.4

NOTES

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 Joshua Tree NP region (1990), six counties have a Catholic majority; in the five remaining counties, Catholics constitute at least 25% of total church membership.

dominant religion expressed as % total church membership (1990)

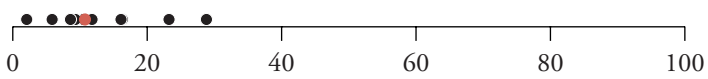
Imperial	50+
La Paz	50+
Los Angeles	50+
Orange	50+
Riverside	50+
Ventura	50+
Clark	25-49
Mohave	25-49
San Bernardino	25-49
San Diego	25-49
Yuma	25-49

NOTES

Religious Groups

English Language Ability

Indicators of English language ability measure how familiar people in an area are with either spoken or written English. One indicator of English language ability is the percent of the total county population over age 5 who report that they do not speak English, or do not speak it very well. Knowledge of English can influence people's ability to access basic public information, to obtain services such as education and health care, to gain many types of employment, and to exercise political power. An awareness of the characteristics of the region's non-English speaking community can help park managers design effective public relations, public participation, and interpretive programs. Within the Joshua Tree NP region, the percent of people lacking in English language ability (1990) ranges from 2% (Mohave) to 28.8% (Imperial).

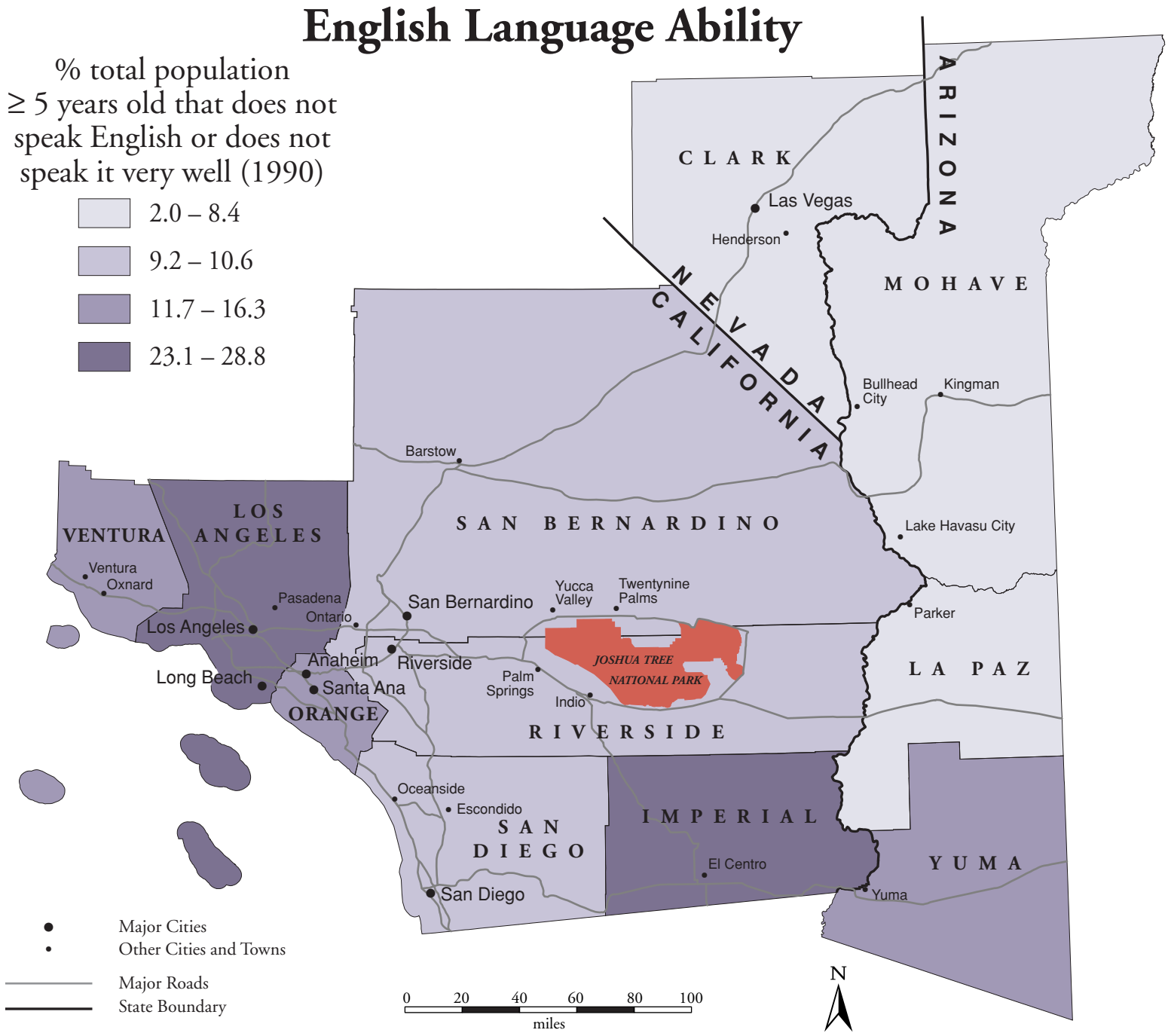


Number Line
showing distribution of data

% total population ≥ 5 years old that does not speak English or does not speak it very well (1990)	
Imperial	28.8
Los Angeles	23.1
Yuma	16.3
Orange	16.0
Ventura	11.7
San Diego	**10.6**
Riverside	10.4
San Bernardino	9.2
La Paz	8.4
Clark	5.7
Mohave	2.0

NOTES

English Language Ability



English Language Ability
(Census Tracts in Selected Counties)

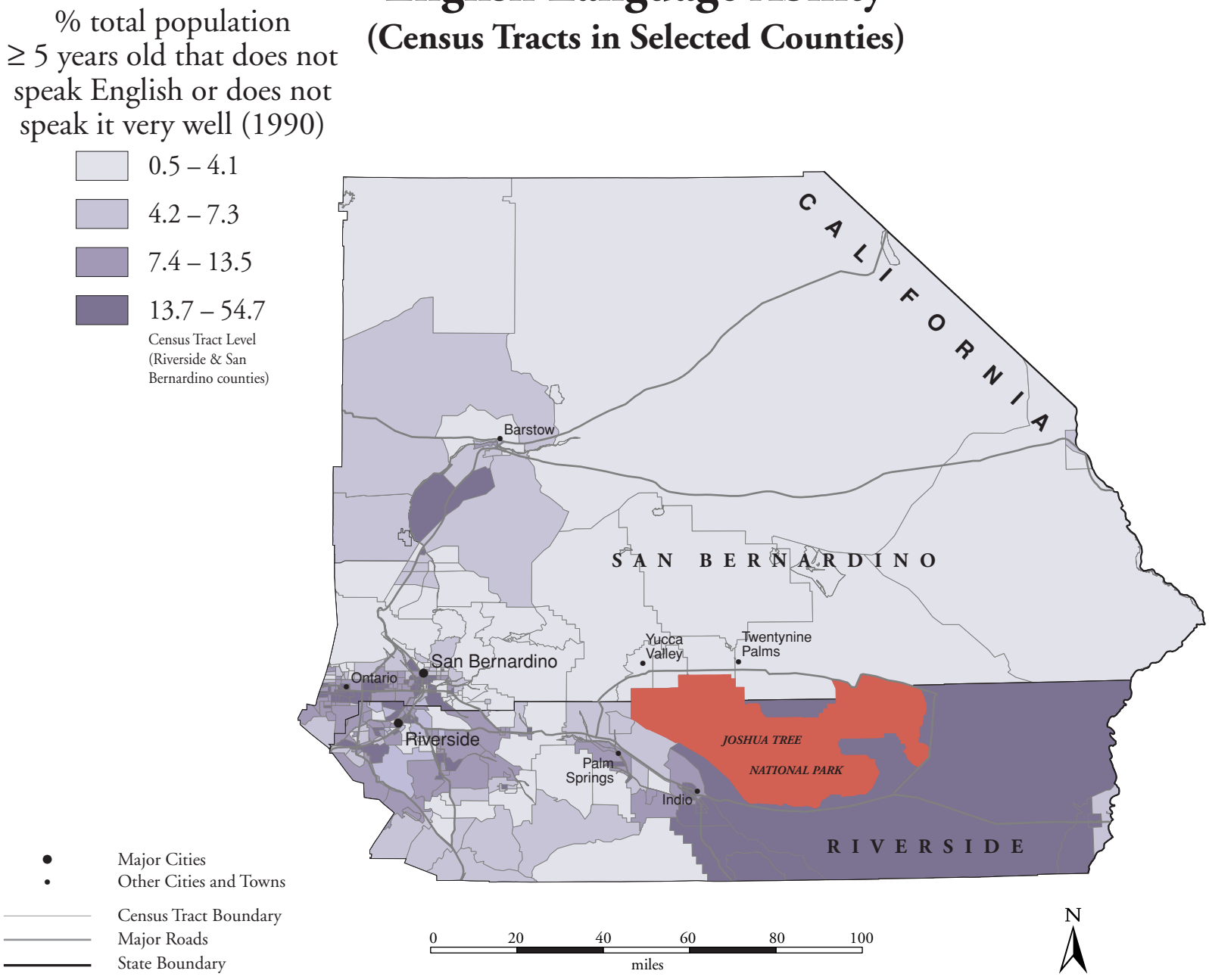
Indicators of English language ability measure how familiar people in an area are with either spoken or written English. One indicator of English language ability is the percentage of the total county population over age 5 who report that they do not speak English, or do not speak it very well. Knowledge of English can influence people's ability to access basic public information, to obtain services such as education and health care, to gain many types of employment, and to exercise political power. An awareness of the characteristics of the region's non-English speaking community can help park managers design effective public relations, public participation, and interpretive programs. Within the counties of San Bernardino and Riverside only, the percentage of people lacking in English language ability (1990) at the census tract level ranges from 0.5% to 54.7%.

Census Tracts

Census tracts are statistically derived county subdivisions encompassing approximately 4,000 people each. However, actual population values can range anywhere from 1,500 people to 8,000 people per census tract. Through the U.S. Census Bureau's Participant Statistical Areas Program, local citizen participants work to delineate the boundaries for all census tracts, defined by areas of similar population characteristics, economic status, and living conditions. Although census tracts are relatively stable statistical boundaries, tracts may be split due to a significant increase in population size, or combined due to a substantial decrease.

NOTES

English Language Ability
(Census Tracts in Selected Counties)



Recreation/Tourism Establishments

The recreation and tourism industry is the segment of the sales/services sector that includes lodging, entertainment such as movie theaters and museums, and personal services such as dry cleaning and tax preparation. Recreation and 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, expressed as a percent, is a broad indicator of the 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 Joshua Tree NP region, the percent of county sales/service establishments that are devoted to recreation/tourism (1992) ranges from 21.5% (Orange) to 33.7% (La Paz).[9]

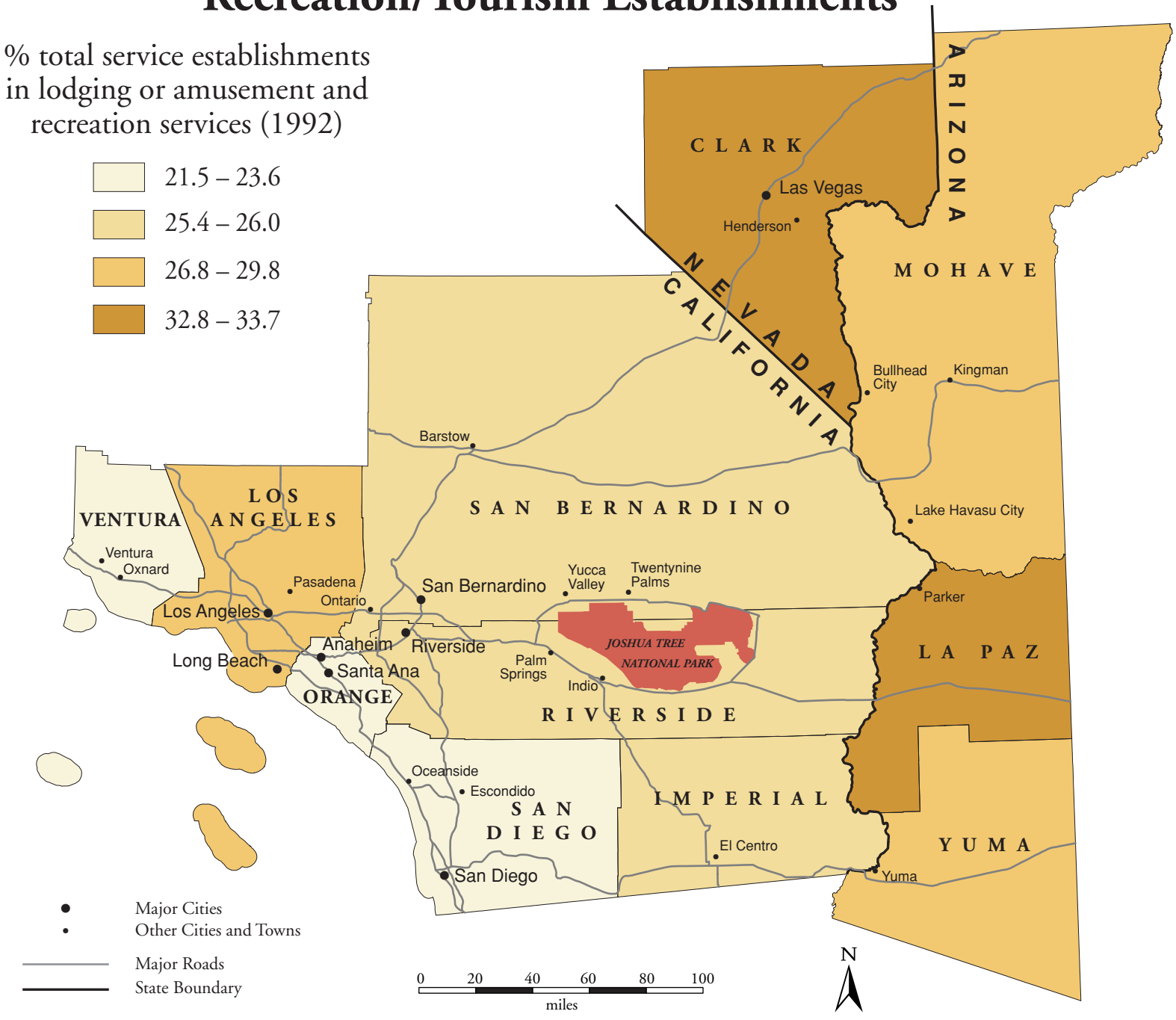
Number Line
showing distribution of data

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

La Paz	33.7
Clark	32.8
Los Angeles	29.8
Mohave	28.9
Yuma	26.8
San Bernardino	**26.0**
Riverside	25.7
Imperial	25.4
Ventura	23.6
San Diego	23.2
Orange	21.5

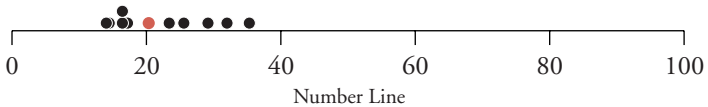
NOTES

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 a proportion 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 Joshua Tree NP region, the recreation/tourism share of total sales/service receipts (1992) ranges from 14.2% (San Bernardino) to 35.4% (Los Angeles), with no data available for Clark County.[10]



Number Line
showing distribution of data

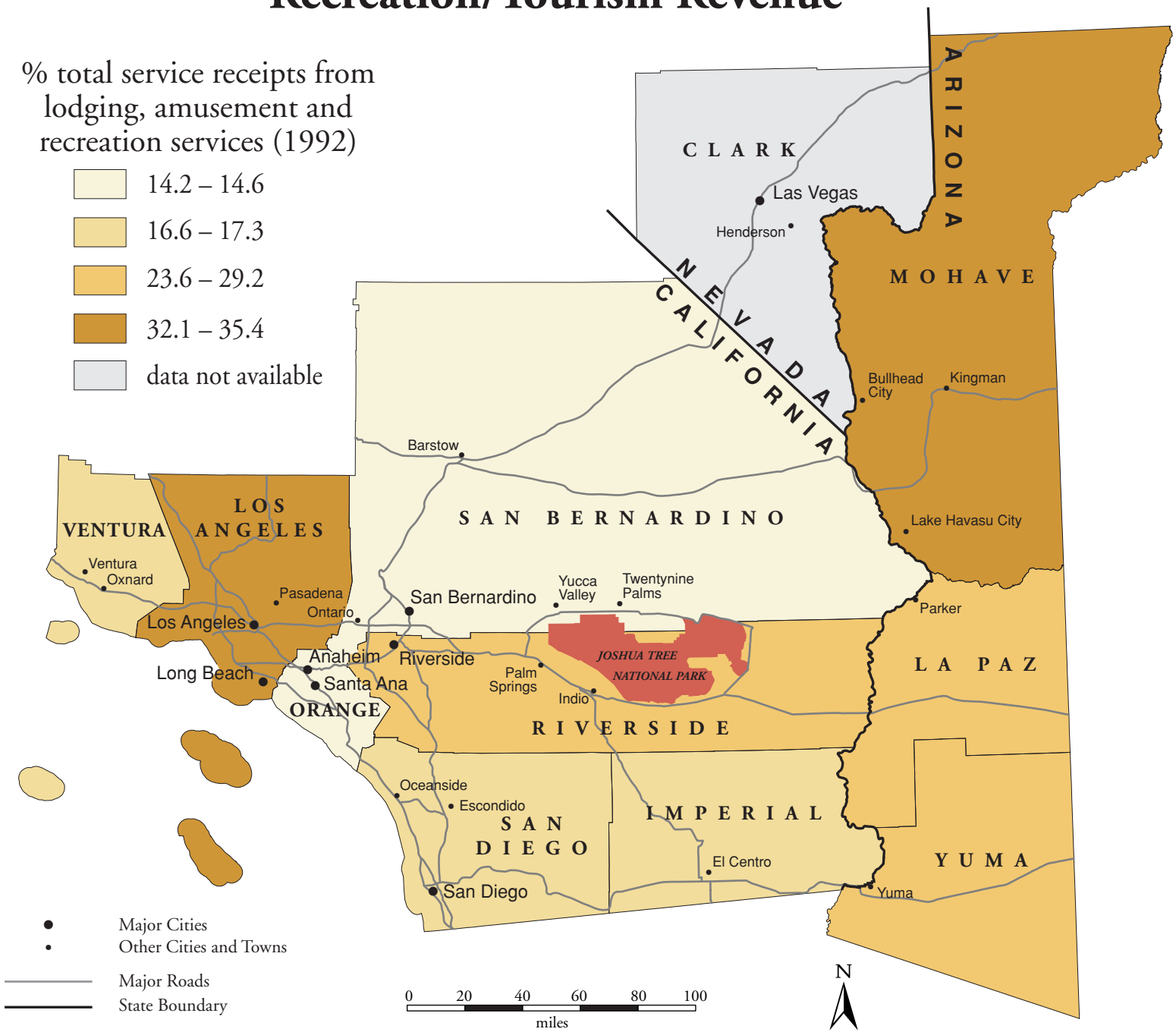
% total service receipts from lodging, amusement and recreation services (1992)

Los Angeles	35.4
Mohave	32.1
La Paz	29.2
Yuma	25.6
Riverside	23.6
Ventura	17.3
Imperial	16.6
San Diego	16.6
Orange	14.6
San Bernardino	14.2

20.5

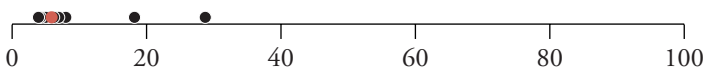
NOTES

Recreation/Tourism Revenue



Recreation/Tourism Employment

The significance of the recreation/tourism industry to a county economy can be indicated by the percent 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 Joshua Tree NP region, the percent of the civilian labor force employed in recreation/tourism (1990) ranges from 3.7% (Imperial) to 28.7% (Clark).[11]



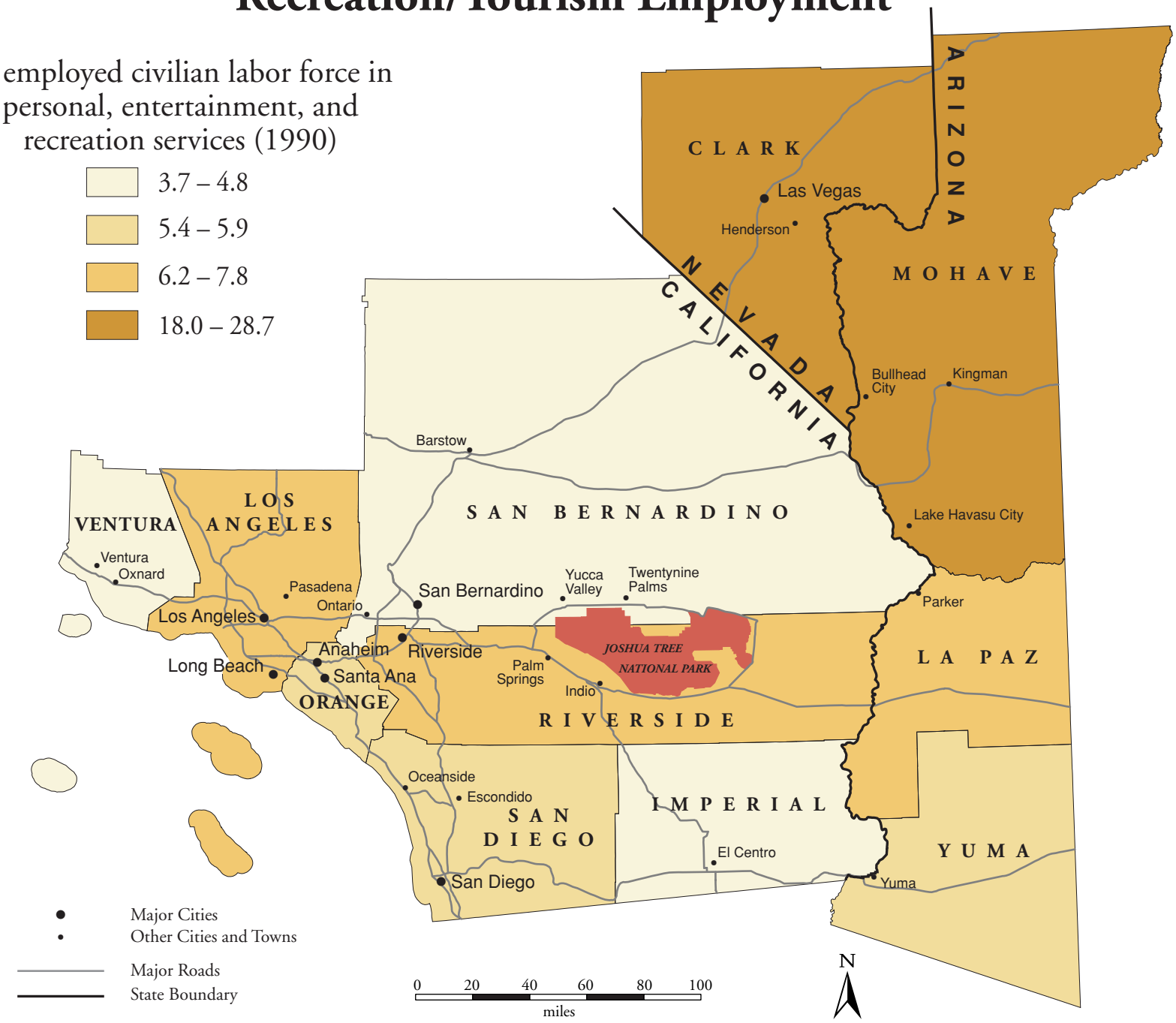
Number Line
showing distribution of data

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

Clark	28.7
Mohave	18.0
La Paz	7.8
Los Angeles	6.8
Riverside	6.2
San Diego	**5.9**
Orange	5.5
Yuma	5.4
Ventura	4.8
San Bernardino	4.0
Imperial	3.7

NOTES

Recreation/Tourism Employment

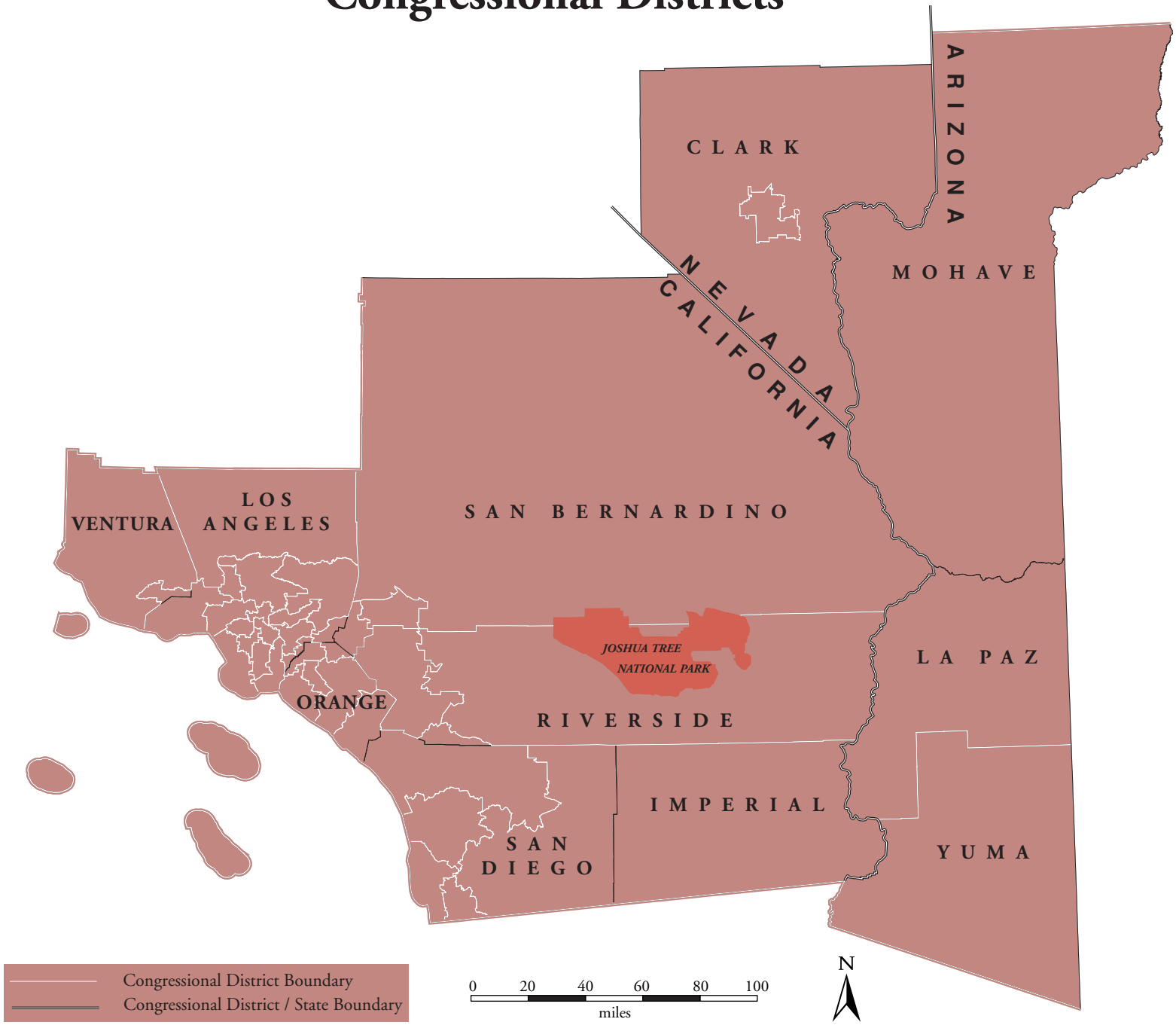


Congressional Districts

Congressional districts form a key layer in the political structure of the Joshua Tree NP 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 Joshua Tree NP region includes all or portions of 34 Congressional districts, 30 of which are in California, based on the 1990 Census.

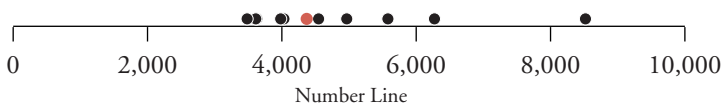
NOTES

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 Joshua Tree NP region, federal expenditures per person (1998) range from $3,473 (Riverside) to $8,524 (La Paz).[12]

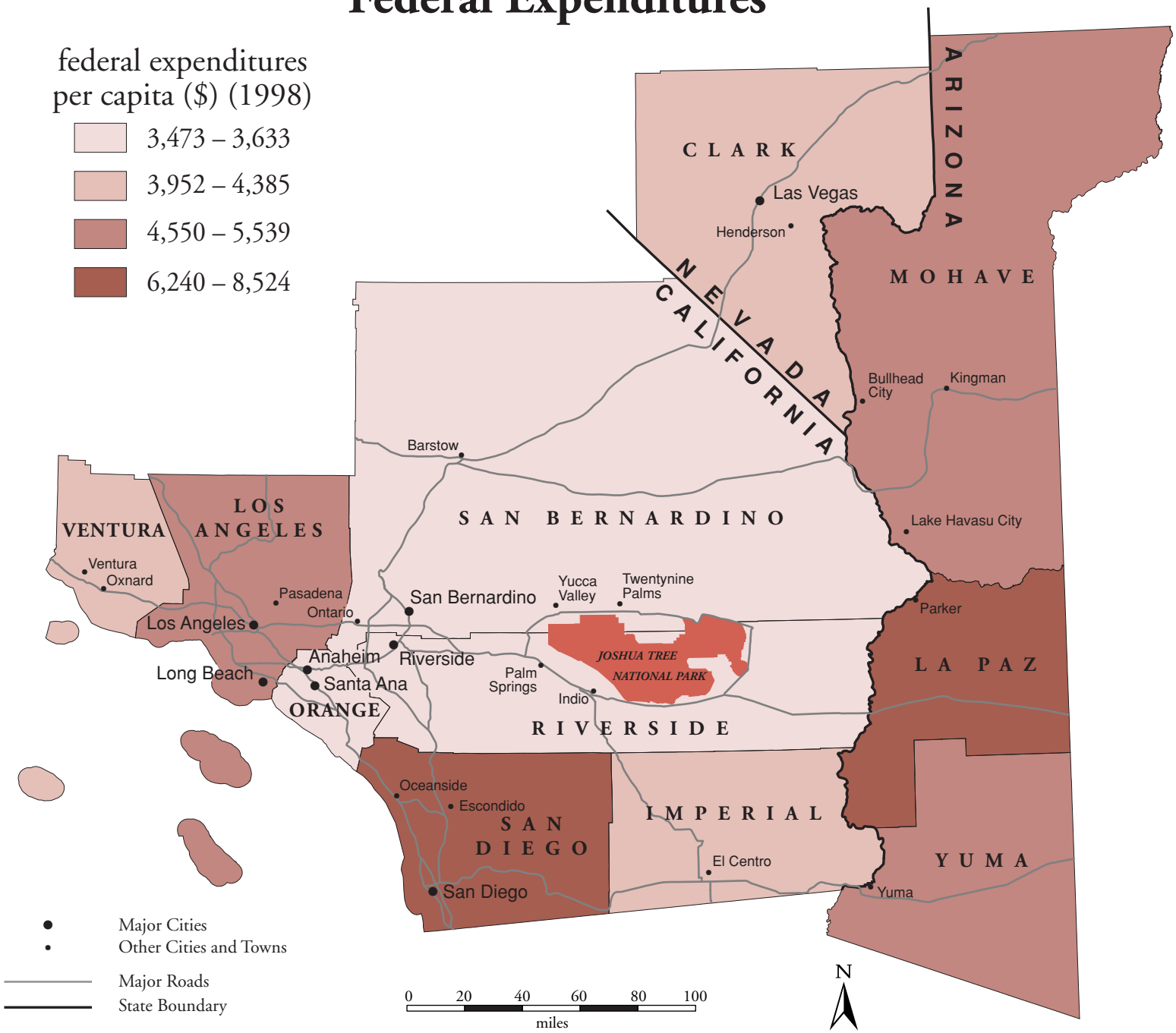


Number Line
showing distribution of data

federal expenditures per capita ($) (1998)	
La Paz	8,524
San Diego	6,240
Yuma	5,539
Mohave	4,968
Los Angeles	4,550
Ventura	**4,385**
Clark	4,005
Imperial	3,952
Orange	3,633
San Bernardino	3,605
Riverside	3,473

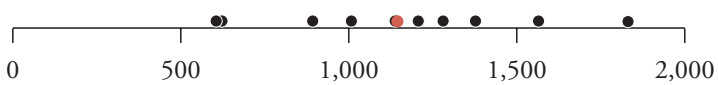
NOTES

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 Joshua Tree NP region, local government revenue per person (1997) ranges from $599 (Yuma) to $1,821 (Clark).

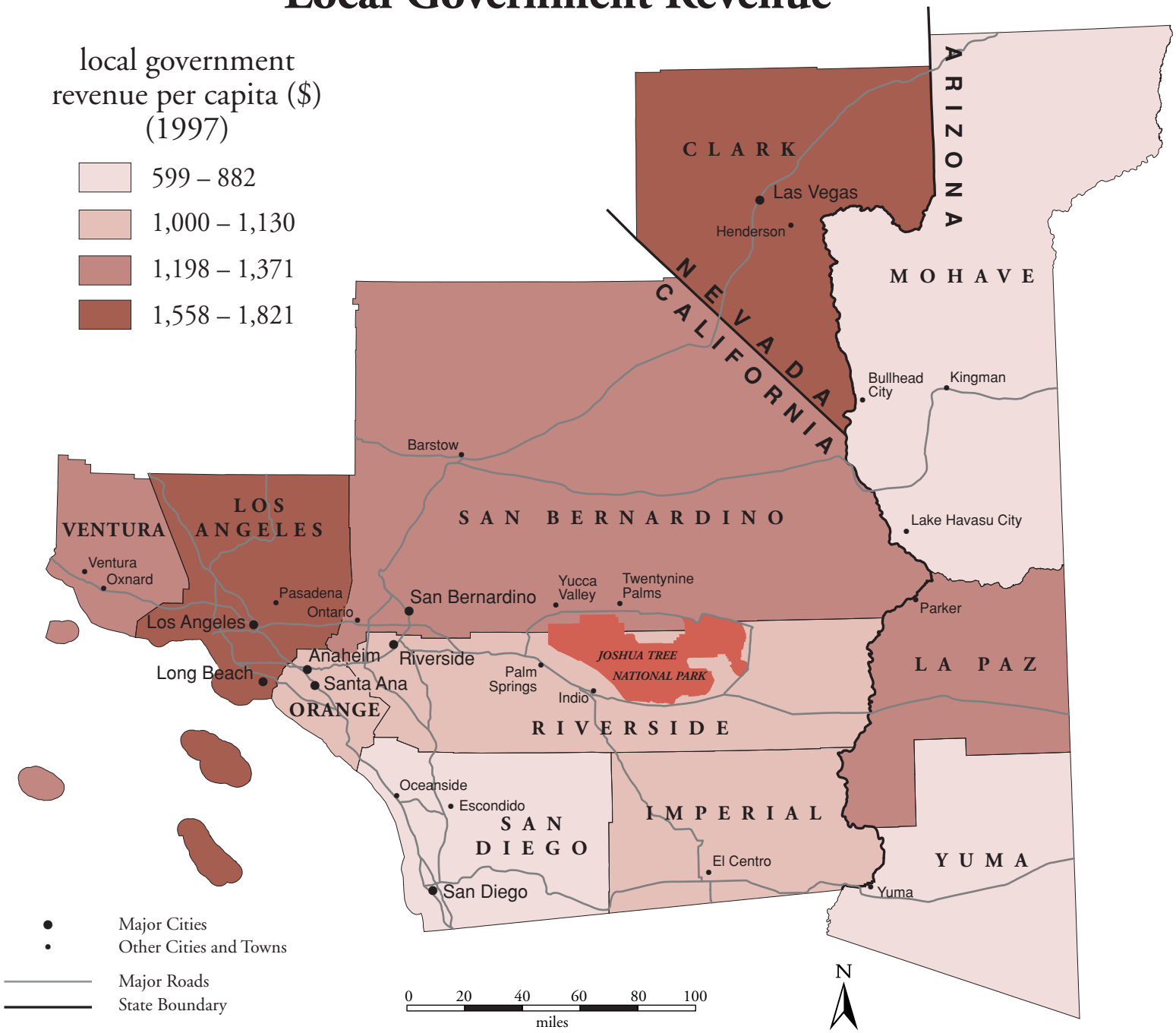


Number Line
showing distribution of data

local government revenue per capita ($) (1997)	
Clark	1,821
Los Angeles	1,558
Ventura	1,371
La Paz	1,271
San Bernardino	1,198
Riverside	**1,130**
Imperial	1,129
Orange	1,000
San Diego	882
Mohave	610
Yuma	599

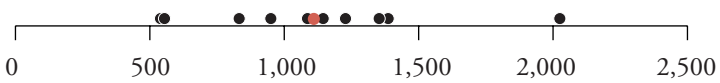
NOTES

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 Joshua Tree NP region, local government expenditures per person (1997) range from $535 (Yuma) to $2,023 (Clark).

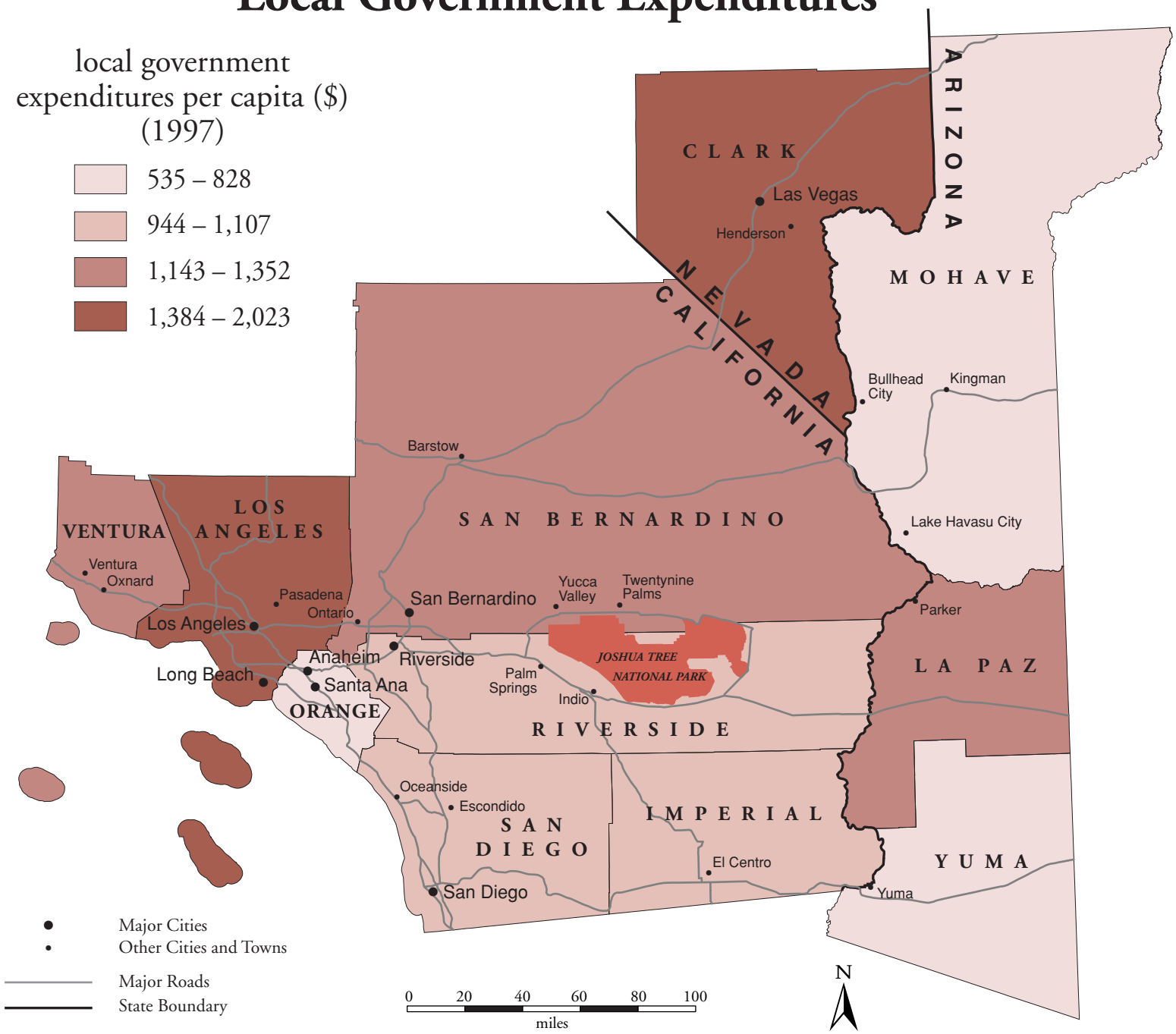


Number Line
showing distribution of data

local government expenditures per capita ($) (1997)	
Clark	2,023
Los Angeles	1,384
La Paz	1,352
San Bernardino	1,227
Ventura	1,143
Riverside	**1,107**
Imperial	1,083
San Diego	944
Orange	828
Mohave	549
Yuma	535

NOTES

Local Government Expenditures



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 Joshua Tree NP region includes parts of five ecoregions, ranging from the Mediterranean ecoregion along the Pacific coast to tropical/subtropical steppe and temperate desert in the northeast.

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. USDA Forest Service, 108 pp.). Following are abridged descriptions of the five ecoregions which overlay the Joshua Tree NP region.

Mediterranean – hot, dry summers and rainy, mild winters, with climate moderated by proximity to the coast. Some moisture received from summer fog. Typically composed of tree species such as cypresses and pines, with sagebrush and grassland communities in valleys and chaparral or oak woodland in the hills.

Mediterranean regime mountains – hot, dry summers and rainy, mild winters. Typically composed of chaparral shrub communities interspersed with forest communities of evergreen trees such as live oak, tanoak, and California laurel. Chaparral communities are adapted to periodic occurrence of lightning-set fires during the summer dry season.

Tropical/subtropical desert – extremely arid with extremely high air and soil temperatures. Typically composed of dry-desert vegetation, such as hard-leaved or spiny shrubs, cacti, hard grasses, and larger plants, such as saguaro and prickly pear cactus, ocotillo, and creosote bush. Some areas have no visible plants.

Tropical/subtropical steppe – hot and semiarid; potential evaporation exceeds precipitation. Typically composed of grasslands of short grasses and other herbs, with locally developed shrub- and woodland. Able to support limited grazing, not generally moist enough for crop cultivation without irrigation. Overgrazing and trampling by livestock can lead to invasion by semidesert shrub vegetation.

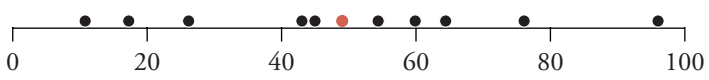
Temperate desert – low rainfall and strong temperature contrasts between summer and winter. Aridity increases markedly in the rain shadow of the Pacific mountain ranges. Typically composed of sagebrush vegetation.

Ecoregions


ecoregion division boundaries
(1995)
Mediterranean
Mediterranean Regime Mountains
Tropical/Subtropical Desert
Tropical/Subtropical Steppe
Temperate Desert
CLARK
Las Vegas
Henderson
ARIZONA
NEVADA
CALIFORNIA
MOHAVE
Bullhead City
Kingman
Barstow
SAN BERNARDINO
Lake Havasu City
VENTURA
LOS ANGELES
Ventura
Oxnard
Pasadena
Ontario
San Bernardino
Yucca Valley
Twentynine Palms
Parker
Los Angeles
Anaheim
Riverside
Long Beach
Santa Ana
Palm Springs
Indio
JOSHUA TREE NATIONAL PARK
LA PAZ
ORANGE
RIVERSIDE
Oceanside
Escondido
SAN DIEGO
IMPERIAL
El Centro
YUMA
Yuma
San Diego
Major Cities
Other Cities and Towns
Major Roads
State Boundary
0 20 40 60 80 100
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 a 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 Joshua Tree NP region, federal land ownership (1998) ranges from 10.9% (Orange) to 95.6% (Clark).[13]

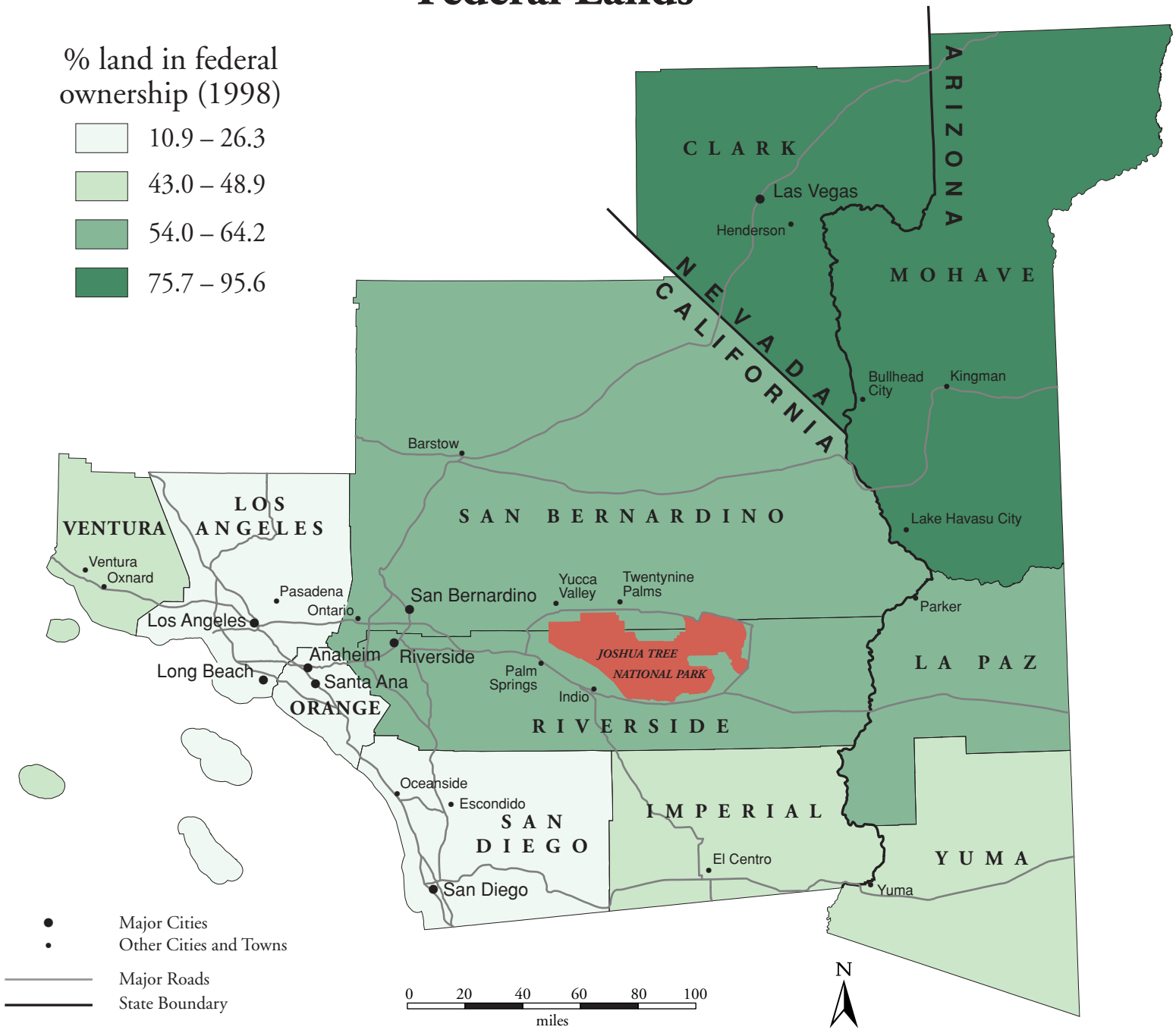


Number Line
showing distribution of data

% land in federal ownership (1998)	
Clark	95.6
Mohave	75.7
La Paz	64.2
San Bernardino	59.7
Riverside	54.0
Ventura	**48.9**
Imperial	44.7
Yuma	43.0
Los Angeles	26.3
San Diego	17.2
Orange	10.9

NOTES

Federal Lands



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 Joshua Tree NP region, change in farmland (1978-1992) ranges from a decrease of 63.8% (Orange) to an increase of 48.8% (Clark).[14]

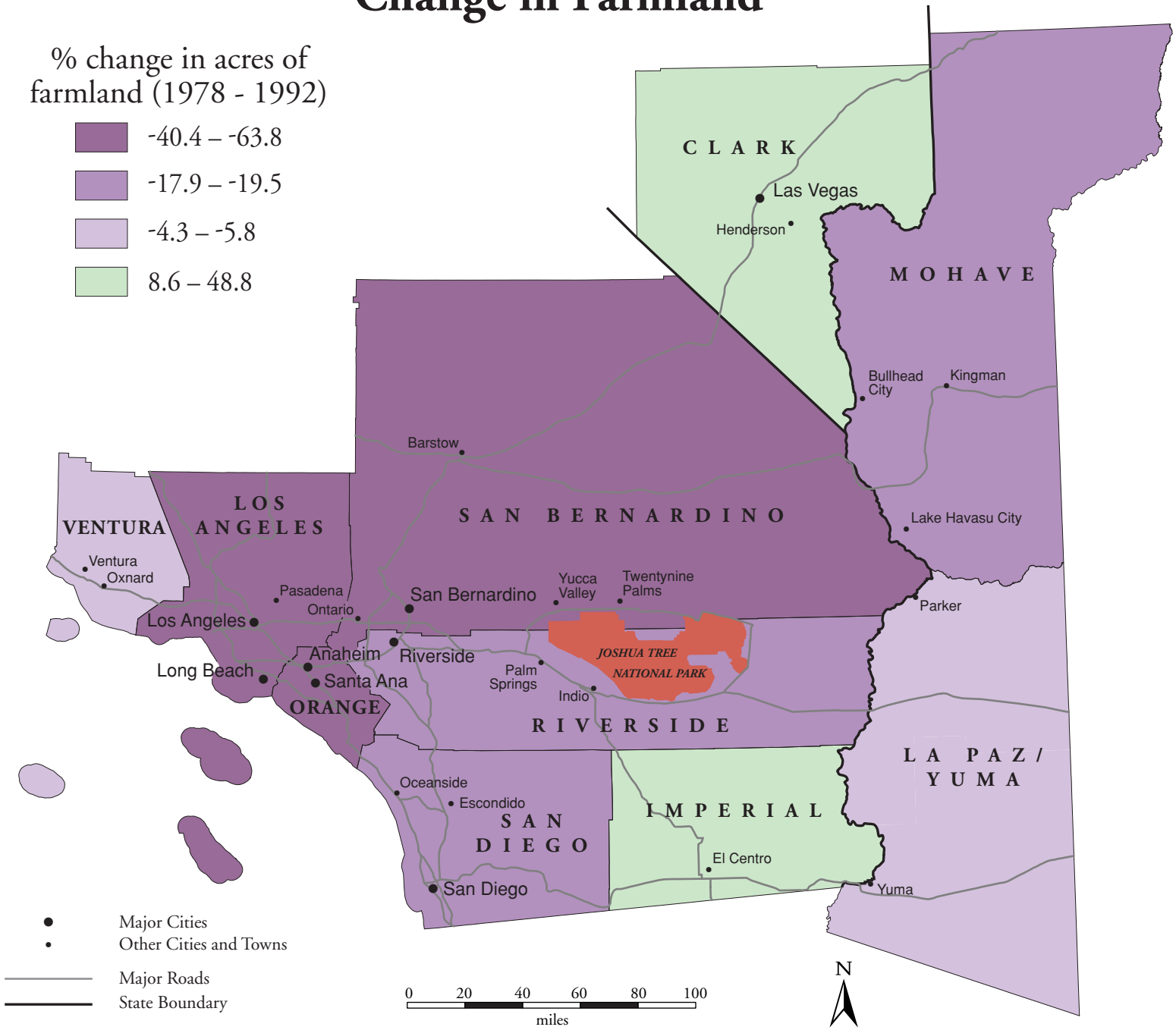
Number Line
showing distribution of data

% change in acres of farmland (1978 - 1992)	
Clark	48.8
Imperial	8.6
La Paz/Yuma	-4.3
Ventura	-5.8
San Diego	-17.9
Mohave	-18.3
Riverside	-19.5
San Bernardino	-40.4
Los Angeles	-50.3
Orange	-63.8

← **-18.1**

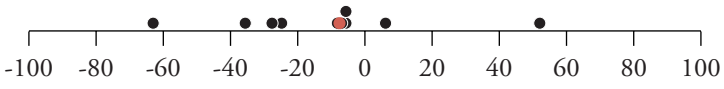
NOTES

Change in Farmland



Change in Irrigated Land

The change over time in the amount of irrigated land in a county can be measured as a percentage increase or decrease in acreage irrigated. Trends in the amount of irrigated land can be associated with environmental impacts such as changes in soil, water, or air quality, as well as economic impacts such as shifts in the demand for agricultural labor, supplies, and equipment. In some cases, conversion of irrigation technology (for example, from surface/gravity irrigation to sprinkler irrigation) can increase the amount of irrigated land without increasing water use. In areas experiencing rapid growth, a loss of irrigated land may indicate conversion of land to non-agricultural uses. Within the Joshua Tree NP region, the change in total land area irrigated (1978-1992) ranges from a decrease of 62.8% (Los Angeles) to an increase of 52% (Mohave).



Number Line
showing distribution of data

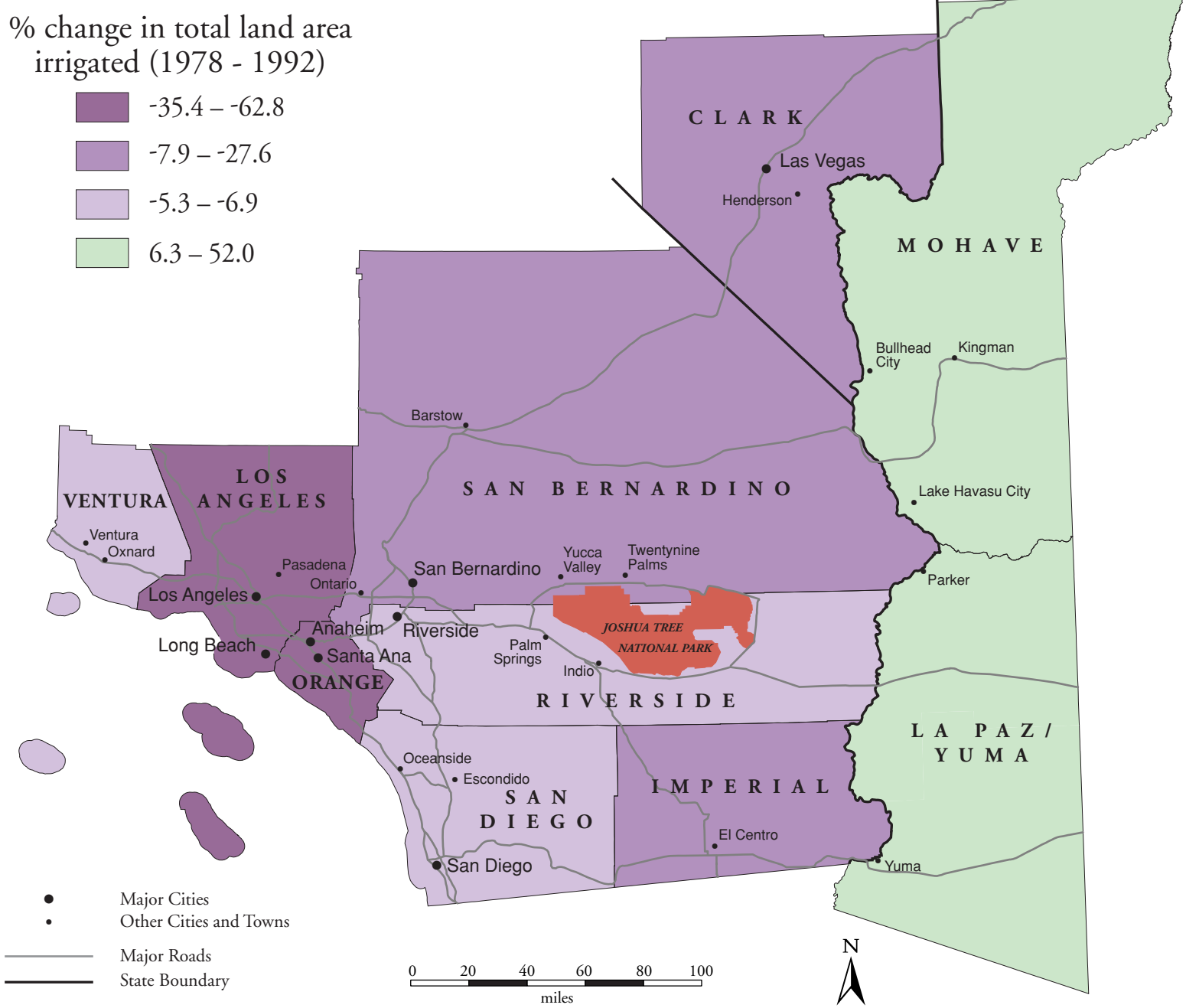
% change in total land area irrigated (1978 - 1992)

Mohave	52.0
La Paz/Yuma	6.3
San Diego	-5.3
Ventura	-5.3
Riverside	-6.9
Imperial	-7.9
Clark	-24.4
San Bernardino	-27.6
Orange	-35.4
Los Angeles	-62.8

-7.4

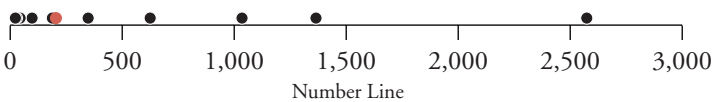
NOTES

Change in Irrigated Land



Irrigation Water Use

The amount of water used for irrigation is an indicator of the relative importance of irrigation agriculture to a county. Particularly in arid regions, the control and distribution of irrigation water is a major source of economic, social, and political power. Irrigation agriculture impacts a park region through its diversion of water from river systems or extraction of water from underground aquifers. Also, like other forms of crop cultivation, irrigation agriculture usually involves the use of mechanized equipment, a range of techniques for tilling the soil, and application of fertilizers and pesticides. All of these practices can influence air, water, and soil quality and are therefore relevant to regional resource management. Within the Joshua Tree NP region, irrigation water use (1995) ranges from 32 million gallons/day (Clark) to 2.57 billion gallons/day (Imperial).[15]

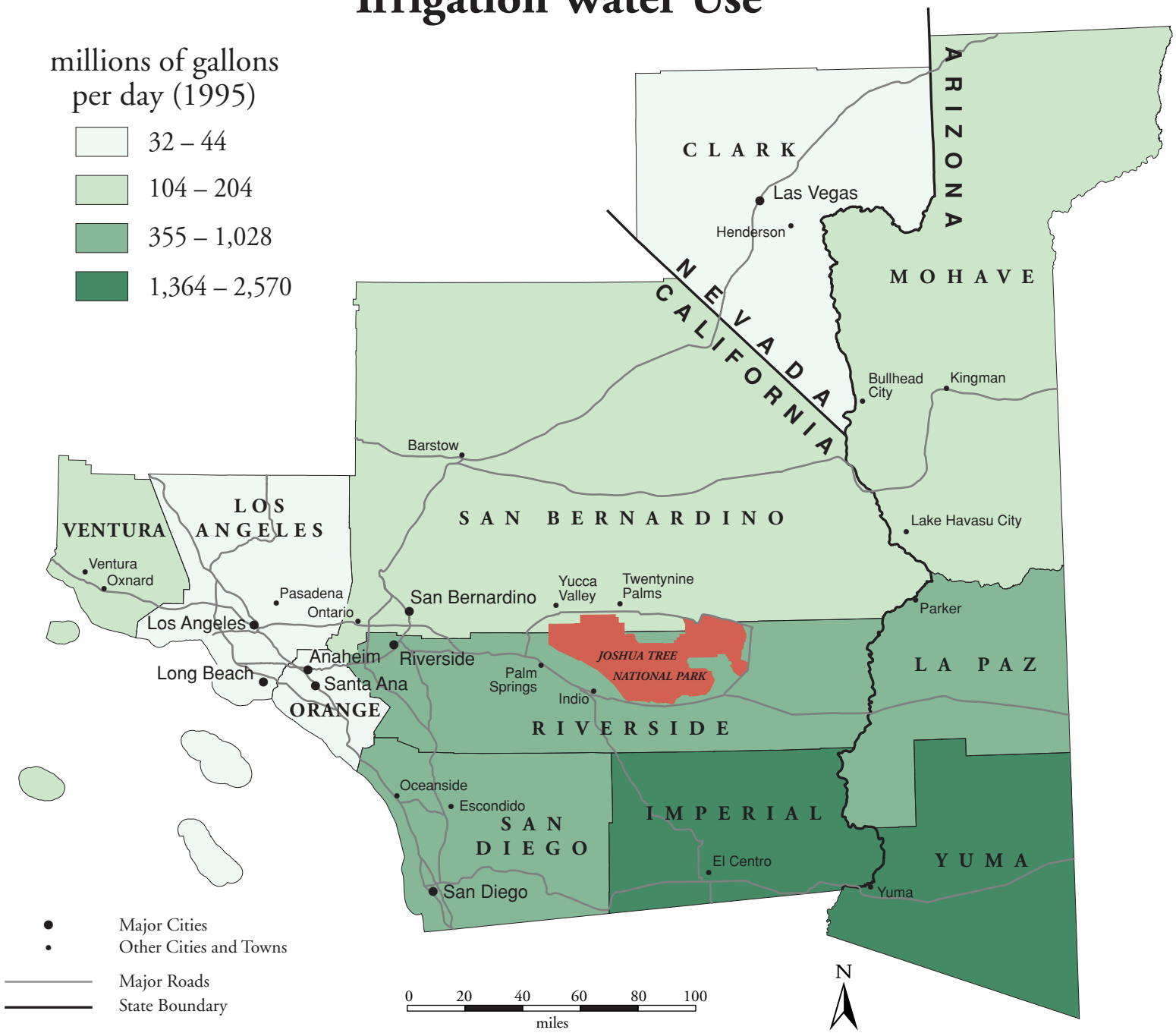


Number Line
showing distribution of data

millions of gallons per day (1995)	
Imperial	2,570
Yuma	1,364
Riverside	1,028
La Paz	627
San Diego	355
Ventura	**204**
San Bernardino	186
Mohave	104
Orange	44
Los Angeles	36
Clark	32

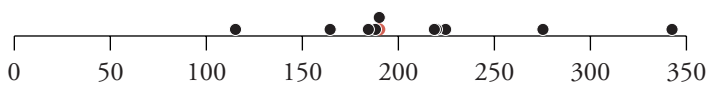
NOTES

Irrigation Water Use



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 Joshua Tree NP region, domestic water use, per person (1995), ranges from 114 gallons/day (Mohave) to 342 gallons/day (Clark).



Number Line
showing distribution of data

gallons of water per day, per person (1995)

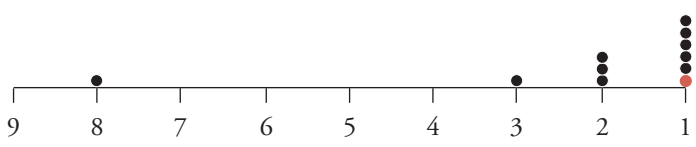
Clark	342
Yuma	275
Riverside	224
La Paz	219
San Bernardino	218
Los Angeles	**189**
Ventura	189
Imperial	188
Orange	184
San Diego	164
Mohave	114

NOTES

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 Joshua Tree NP region (1997), nine of the eleven counties are classified as belonging to either "small metropolitan" or "large metropolitan" areas.[16]



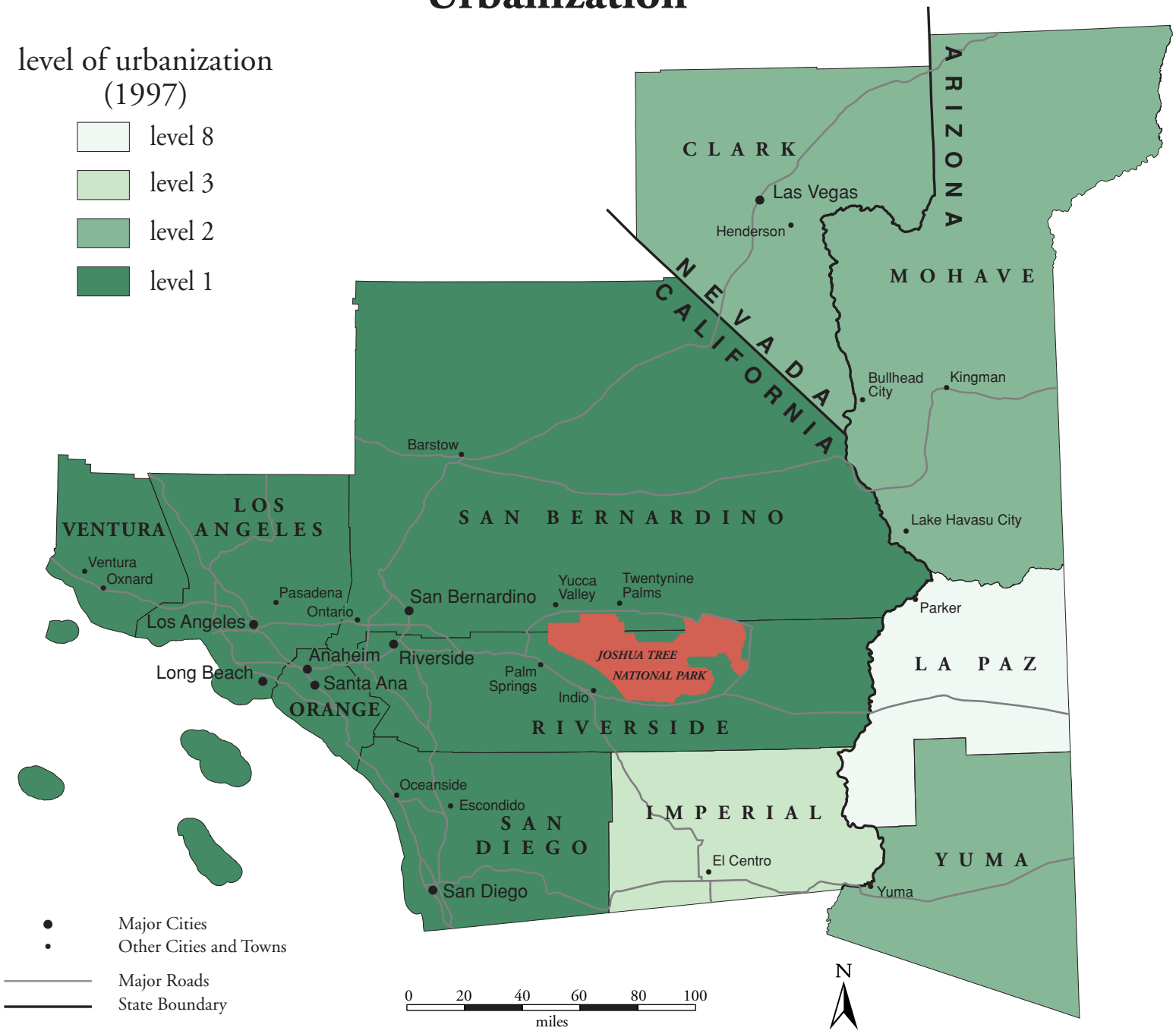
Number Line
showing distribution of data

level of urbanization (1997)	
Los Angeles	1
Orange	1
Riverside	1
San Bernardino	1
San Diego	1
Ventura	**1**
Clark	2
Mohave	2
Yuma	2
Imperial	3
La Paz	8

1 Part of large metro area of 1 million+
2 Part of small metro area of <1 million
3 Adjacent to large metro area, and has city of 10,000+
8 Not adjacent to metro area, has town of 2,500 to 9,999

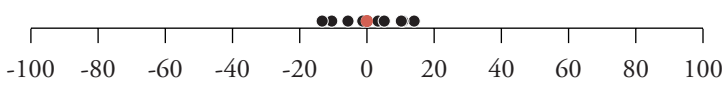
NOTES

Urbanization



Change in Building Permits

One indicator of growth in a local economy is the annual change in the number of building permits issued. 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 Joshua Tree NP region, the average change in the number of building permits issued annually (1987-1997) ranges from a decrease of 13.1% (Los Angeles) to an increase of 14.1% (Clark).[17]

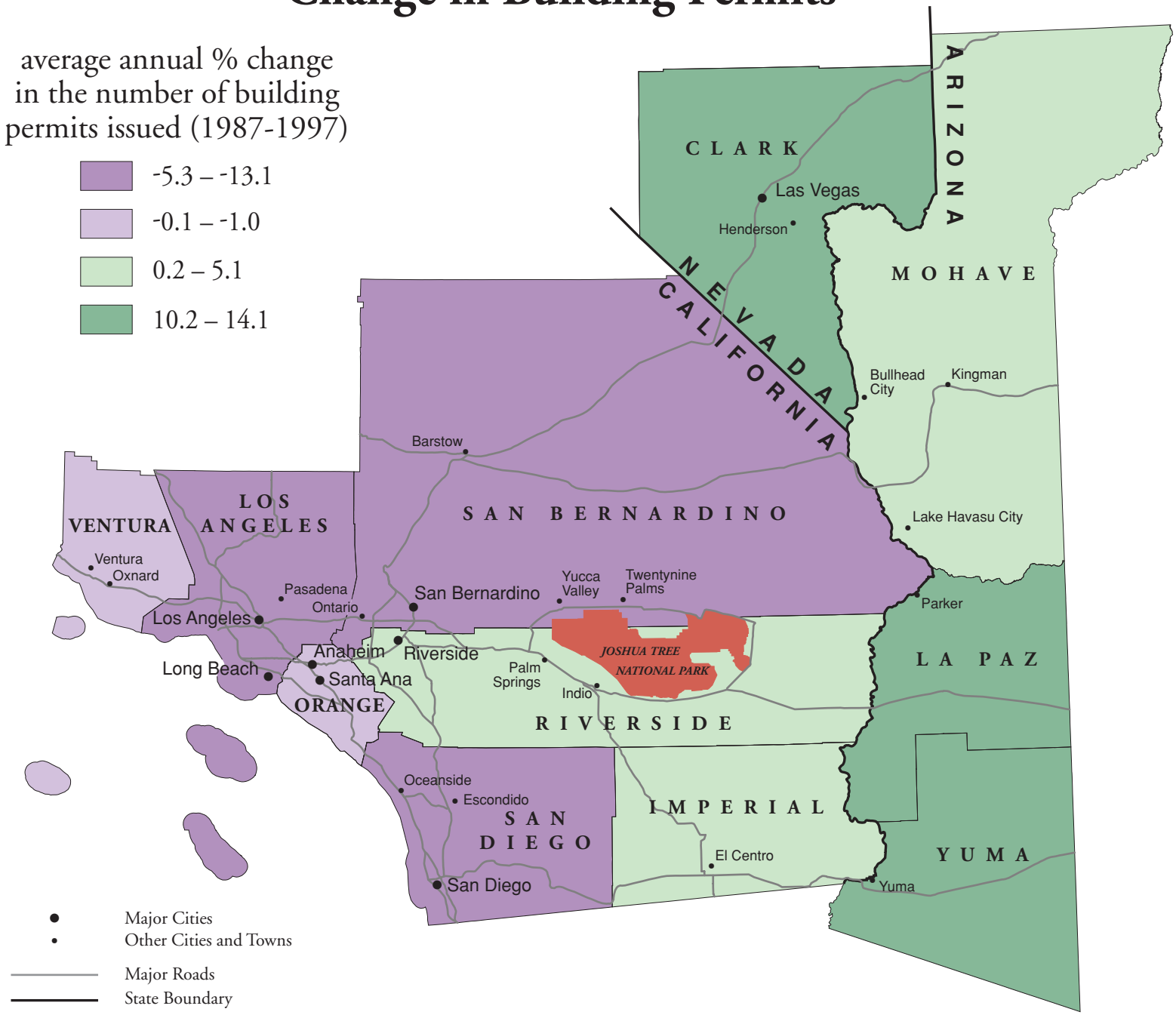


Number Line
showing distribution of data

average annual % change in the number of building permits issued (1987-1997)	
Clark	14.1
Yuma	10.6
La Paz	10.2
Mohave	5.1
Imperial	3.2
Riverside	**0.2**
Orange	-0.1
Ventura	-1.0
San Diego	-5.3
San Bernardino	-10.2
Los Angeles	-13.1

NOTES

Change in Building Permits



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 Joshua Tree National 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 evaluate 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 help understand the 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 Joshua Tree National 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 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
*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
Population Density Change	% change in average number of people per square mile (1980-1997)	1) U.S. Department of Commerce, Census Bureau. USA Counties 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC. 2) U.S. Department of Commerce, Census Bureau, http://www.census.gov/population/www/estimates/countypop.html
Projected Population Density	projected average number of people per square mile (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

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
Projected Median Age	projected median age of total population (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
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
*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
Change in Employment by Industry	% change in employment by industrial category (1980-1996)	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 are: Hispanic, 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/

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
*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, Bureau of the Census. USA Counties 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
*Religious Groups	dominant religion expressed as % total chruch 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.
English Language Ability	% total population 5 years old and over that does not speak English, or does not speak it very well (1990)	GeoLytics, Inc. (1998). CensusCD+Maps [CD-ROM]. East Brunswick, NJ. GeoLytics, Inc. specializes in the compression and distribution of publicly available demographic data to the public, private and nonprofit sectors. http://www.geolytics.com
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 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
*Recreation/Tourism Revenue	% of total service receipts from lodging, amusement and recreation services (1992)	U.S. Department of Commerce, Census Bureau. USA Counties 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
*Recreation/Tourism Employment	% employed civilian labor force in personal, entertainment, and recreation services (1990)	U.S. Department of Commerce, Census Bureau. USA Counties 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
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

Appendix 1: Data Sources for Indicators (continued)

INDICATOR	MEASURE	DATA SOURCE
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
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.
*Change in Farmland	% change in acres of farmland (1978-1992)	U.S. Department of Commerce, Census Bureau. USA Counties 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
Change in Irrigated Land	% change in total land area irrigated (1978-1992)	U.S. Department of Commerce, Census Bureau. USA Counties 1996: A Statistical Abstract Supplement [CD-ROM]. Washington, DC.
Irrigation Water Use	millions of gallons per day (1995)	U.S. Department of the Interior, U.S. Geological Survey, http://water.usgs.gov/watuse/spread95.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 issued (1987-1997)	U.S. Department of Commerce, Census Bureau. USA Counties 1998, http://tier2.census.gov/usac/index.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) Whenever the number of counties cannot be evenly divided by four, the convention for this atlas series is to reduce the size of the highest quartile first, then the next quartile if needed, then the third quartile if needed. Hence eleven counties would be divided into groups of 2, 3, 3, and 3, with the group of 2 having the highest data values/darkest shading. (2) Counties with identical data values are grouped in the same quartile, even if this results in quartiles of unequal size.

Note on La Paz County – La Paz County, Arizona was formerly part of Yuma County. La Paz was established as a separate county on January 1, 1983. In cases where indicators rely on data that predate the separation of the two counties, La Paz and Yuma counties are combined as one entity on the map.

Note on Political Boundaries – The regional base map depicts the formally defined political boundaries of states and counties. These boundaries extend beyond the ocean and include waters surrounding offshore islands.

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] **Population Density** is measured as the average number of people per square mile. This number is calculated by dividing the total number of people in 1997 by the total area per county. Several counties in the Joshua Tree NP region have large areas of uninhabited or sparsely populated federal land. Excluding these areas from the calculation of population density would result in a higher population density.

[2] See note above on Population Density.

[3] 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.

[4] See note above on Industry Categories.

[5] See note above on Industry Categories.

[6] **Poverty** is measured as the percent 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.

[7] **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/Latino origin may be of any race.

[8] **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/Latino origin category was not included in this measure because persons of Hispanic/Latino origin may be of any race (including White).

[9] **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.

[10] See note above on Recreation/Tourism.

[11] See note above on Recreation/Tourism.

[12] **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 capitol is located is reported as having "received' that "pass-through" grant, even though the monies are subsequently distributed to other local governments.

[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] **Irrigation Water Use** includes water used for cash grains, other field crops, vegetables and melons, fruits and tree nuts, horticultural specialties, general farms, irrigation systems, public golf courses, and membership sports/recreation clubs. The amount of land area that can be irrigated using a given quantity of water varies depending on factors such as type of crop, soil type, climate, weather, and irrigation technology being used.

[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** 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

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Printed: 10/2001

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