A Socioeconomic Atlas for Canyon de Chelly National Monument and its Region 2004
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by
Jean E. McKendry
Cynthia A. Brewer
Joel M. Staub

2004
Acknowledgments

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About this Atlas

This atlas is one in a developing National Park Service atlas series. The purpose of the atlas series is to show socioeconomic trends for regions around individual national park units. Pilot atlases were completed for Harpers Ferry National Historical Park, Joshua Tree National Park, Mount Rainier National Park, and Wilson's Creek National Battlefield. The potential to link these atlases to park planning, e.g., updating the General Management Plan, is being explored with a second series of atlases that began with the Blue Ridge Parkway.

After NPS produced the Blue Ridge Parkway atlas, atlases in the second series have been created in collaboration with the Department of Geography at the Pennsylvania State University. Canyon de Chelly National Monument is one of the atlases in the second series. For more information about the atlas series, contact Jean McKendry, National Park Service, 1849 C Street NW (3130), Washington, DC 20240 (jean_mckendry@partner.nps.gov).

About the Authors

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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, an action plan for preserving natural resources and our country’s natural heritage within the complexities of modern landscapes (http://www1.nature.nps.gov/challenge/index.htm).

This atlas 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 Canyon de Chelly National Monument. 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 an aid to management and planning, as a training tool, 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
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 Canyon de Chelly National Monument. These changes 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 boundary lines, roads, and key towns) with thematic information (such as demographic or economic statistics). 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 of orienting 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’ 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 Canyon de Chelly National Monument 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, 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 within 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 67 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 series. The core indicators provide information useful 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. Canyon de Chelly National Monument staff chose additional indicators from the menu described above. Park staff selected these indicators to customize the atlas so that it would target information relevant to their particular management needs. Figure 1 shows the six general categories and the specific indicators included in this atlas; for each category, indicators are listed in the order they appear in the atlas.

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

Technical Notes

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

In selecting the boundaries of the region of interest covered by this atlas, Canyon de Chelly National Monument (NM) 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 Apache and Navajo counties in Arizona; McKinley and San Juan counties in New Mexico; Dolores, La Plata, and Montezuma counties in Colorado; and San Juan county in Utah. The map on the facing page depicts the region in its larger context.

Canyon de Chelly NM is located in the four corners region of the Southwest. It is approximately 180 miles northeast of Flagstaff, Arizona, and 230 miles northwest of Albuquerque, New Mexico. This area is part of the Colorado Plateau, known for its spectacular layers of colored rock and consisting primarily of high desert with scattered mesas. Interesting geological formations, including deep canyons formed centuries ago, cut through parts of the region. Unique petrified forests are located here, as are extinct volcanoes and ancient lava fields. Lake Powell, created when the Glen Canyon of the Colorado River was dammed, is northwest of the national monument on the Utah-Arizona border.

The region has been home to Native American groups for centuries. It was home to the Archaic peoples as well as Anasazi (now commonly known as the Ancestral Puebloans). American Indians make up 52.9% of the present day population. The Navajo Nation occupies much of northeastern Arizona and northwestern New Mexico, extending into southern Utah. The Hopi Indian Reservation (AZ), Ute Mountain Ute Reservation (CO and NM), and Zuni Indian Reservation (NM) are also located in this region. The area is predominantly rural, with few large towns.

Per capita income in the counties of the region is lower than national and statewide averages, and unemployment percentages are relatively high. The largest employment sectors are services, government, and retail trade. Tourism is an increasingly important industry as the area provides a unique and beautiful natural environment and agreeable climate. The diverse cultures and deep history of the region attract visitors as well. Some irrigated farming and ranching takes place in selected areas. Mineral extraction, though not as important as in the past, continues to contribute to local economies.

In addition to Canyon de Chelly NM, the region contains all or part of several other national park units, including Aztec Ruins NM, Canyonlands National Park (NP), Chaco Culture National Historical Park (NHP), Glen Canyon National Recreation Area (NRA), Hovenweep NM, Hubbell Trading Post National Historic Site (NHS), Mesa Verde NP, Natural Bridges NM, Navajo NM, Petrified Forest NP, Rainbow Bridge NM, and Yucca House NM.
Canyon de Chelly National Monument and its Region

Elevation
(in feet above sea level)

- > 12,000
- 9,000 - 12,000
- 7,500 - 9,000
- 6,000 - 7,500
- 4,500 - 6,000
- 3,000 - 4,500
- 1,800 - 3,000
- 1,200 - 1,800
- 600 - 1,200
- 300 - 600
- 150 - 300
- 0 - 150
- below sea level

- State Capitals
- Major Cities
- Other Cities and Towns
- International Boundaries
- State Boundaries
- Region of Interest

0 25 50 75 100 miles

The Region
Using the Socioeconomic Indicators and Maps

The socioeconomic indicators for the Canyon de Chelly National Monument 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 shown with an arrow and bold type. 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). Maps in the same general category share similar sets of color symbols.
- 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 displaying national and state data that can be compared with regional county data.
- A map that displays general patterns 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 83.
The Socioeconomic Indicators
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 Canyon de Chelly NM region, county population (2003) ranges from 1,825 (Dolores) to 122,272 (San Juan, NM).¹

<table>
<thead>
<tr>
<th>County</th>
<th>Population (2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>1,825</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>13,901</td>
</tr>
<tr>
<td>Montezuma</td>
<td>24,335</td>
</tr>
<tr>
<td>La Plata</td>
<td>46,229</td>
</tr>
<tr>
<td>Apache</td>
<td>68,129</td>
</tr>
<tr>
<td>McKinley</td>
<td>72,555</td>
</tr>
<tr>
<td>Navajo</td>
<td>104,280</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>122,272</td>
</tr>
</tbody>
</table>

¹ The total number of people is 290,809,777.

total number of people
(2003)

- National = 290,809,777
- Arizona = 5,580,811
- Colorado = 4,550,688
- New Mexico = 1,874,614
- Utah = 2,351,467
Total Population

total number of people (2003)

- 1,825 - 13,901
- 24,335 - 46,229
- 68,129 - 72,555
- 104,280 - 122,272
Population change is due to birth, death, 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 Canyon de Chelly NM region, county growth rates (1970 - 1990) ranged from a decrease of 8.1% (Dolores) to an increase of 87.9% (Apache).

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

- Dolores: -8.1
- San Juan, UT: 31.4
- McKinley: 40.9
- Montezuma: 43.1
- Navajo: 61.5
- La Plata: 67.4
- San Juan, NM: 73.3
- Apache: 87.9

52.3

Number Line showing distribution of data

National = 22.3
Arizona = 104.5
Colorado = 48.5
New Mexico = 48.4
Utah = 62.0
General Population

Historical Population Change

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

-8.1* - 31.4
40.9 - 43.1
61.5 - 67.4
73.3 - 87.9

* only negative number

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
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 Canyon de Chelly NM region, the recent increase in county population (1990 - 2000) ranges from 12.7% (Apache) to 36.1% (La Plata).

<table>
<thead>
<tr>
<th>County</th>
<th>% change in total number of people (1990 - 2000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>12.7</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>14.2</td>
</tr>
<tr>
<td>Dolores</td>
<td>22.6</td>
</tr>
<tr>
<td>McKinley</td>
<td>23.3</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>24.2</td>
</tr>
<tr>
<td>Navajo</td>
<td>25.5</td>
</tr>
<tr>
<td>Montezuma</td>
<td>27.6</td>
</tr>
<tr>
<td>La Plata</td>
<td>36.1</td>
</tr>
</tbody>
</table>

National = 13.2  
Arizona = 13.7  
Colorado = 30.6  
New Mexico = 20.1  
Utah = 29.6
Recent Population Change

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

- 12.7 - 14.2
- 22.6 - 23.3
- 24.2 - 25.5
- 27.6 - 36.1
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 Canyon de Chelly NM region, the projected increase in county population by the year 2020 ranges from 10.3% (Dolores) to 58.5% (Navajo).²

<table>
<thead>
<tr>
<th>County</th>
<th>Projected % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>10.3</td>
</tr>
<tr>
<td>Apache</td>
<td>28.5</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>34.2</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>35.9</td>
</tr>
<tr>
<td>McKinley</td>
<td>39.4</td>
</tr>
<tr>
<td>Montezuma</td>
<td>46.1</td>
</tr>
<tr>
<td>La Plata</td>
<td>47.3</td>
</tr>
<tr>
<td>Navajo</td>
<td>58.5</td>
</tr>
</tbody>
</table>

National % Change: 21.1
Arizona % Change: 48.4
Colorado % Change: 34.4
New Mexico % Change: 31.2
Utah % Change: 46.3
Projected Population Change

projected % change in total number of people (2000 - 2020)

- 10.3 - 28.5
- 34.2 - 35.9
- 39.4 - 46.1
- 47.3 - 58.5

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Population density is a measure of population in terms of persons per square mile. Higher concentrations of people tend to support more business activities and can generate greater demand for public goods ranging from roads to open space. Thus, monitoring differences in population density can be an important way to detect potential stresses and impacts on natural resources in the park region. Within the Canyon de Chelly NM region, county population density (2000) ranges from 1.7 people per square mile (Dolores) to 26.0 people per square mile (La Plata).³

<table>
<thead>
<tr>
<th>County</th>
<th>Average Density (2000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>1.7</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>1.8</td>
</tr>
<tr>
<td>Apache</td>
<td>6.2</td>
</tr>
<tr>
<td>Navajo</td>
<td>9.8</td>
</tr>
<tr>
<td>Montezuma</td>
<td>11.7</td>
</tr>
<tr>
<td>McKinley</td>
<td>13.7</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>20.6</td>
</tr>
<tr>
<td>La Plata</td>
<td>26.0</td>
</tr>
</tbody>
</table>

National Average = 79.6
Arizona = 45.1
Colorado = 41.5
New Mexico = 15.0
Utah = 27.2
Population Density

average number of people per square mile (2000)

- 1.7 - 1.8
- 6.2 - 9.8
- 11.7 - 13.7
- 20.6 - 26.0

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Population density change is an alternate means to describe population growth, stability, or decline. Steady or decelerating growth over a 20-year time period suggests that government and institutions can anticipate and plan for needs in advance. Accelerating population growth may be placing stress on government and institutions to respond rapidly to changes in civic life, industry, infrastructure, and the use of land and resources. Within the Canyon de Chelly NM region, the change in county population density (1980 - 2000) ranges from 8.0% (Dolores) to 60.3% (La Plata).
% change in average number of people per square mile (1980 - 2000)

- 8.0 - 15.2
- 32.0 - 34.7
- 40.4 - 44.0
- 44.4 - 60.3
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 Canyon de Chelly NM region, projected county population density for the year 2020 ranges from 1.9 people per square mile (Dolores) to 38.5 people per square mile (La Plata).  

<table>
<thead>
<tr>
<th>County</th>
<th>Projected Average Number of People per Square Mile (2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>1.9</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>2.5</td>
</tr>
<tr>
<td>Apache</td>
<td>8.0</td>
</tr>
<tr>
<td>Navajo</td>
<td>15.6</td>
</tr>
<tr>
<td>Montezuma</td>
<td>17.2</td>
</tr>
<tr>
<td>McKinley</td>
<td>19.2</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>28.1</td>
</tr>
<tr>
<td>La Plata</td>
<td>38.5</td>
</tr>
</tbody>
</table>

Projected average number of people per square mile (2020)

National = 96.6
Arizona = 67.5
Colorado = 56.0
New Mexico = 19.7
Utah = 39.9
Projected Population Density

Projected average number of people per square mile (2020)

- 1.9 - 2.5
- 8.0 - 15.6
- 17.2 - 19.2
- 28.1 - 38.5

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
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 Canyon de Chelly NM region, projections for median age in the year 2020 range from 28.9 (San Juan, UT) to 45.1 (Dolores).

![Number Line showing distribution of data](image)

<table>
<thead>
<tr>
<th>County</th>
<th>Median Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Juan, UT</td>
<td>28.9</td>
</tr>
<tr>
<td>McKinley</td>
<td>30.7</td>
</tr>
<tr>
<td>Apache</td>
<td>31.2</td>
</tr>
<tr>
<td>Navajo</td>
<td>33.7</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>35.0</td>
</tr>
<tr>
<td>Montezuma</td>
<td>40.7</td>
</tr>
<tr>
<td>La Plata</td>
<td>43.2</td>
</tr>
<tr>
<td>Dolores</td>
<td>45.1</td>
</tr>
</tbody>
</table>

Projected median age of total population (2020)

- National = 37.1
- Arizona = 35.7
- Colorado = 36.4
- New Mexico = 36.4
- Utah = 30.5

34.4
Projected Median Age

Projected median age of total population (2020)

- Light Blue: 28.9 - 30.7
- Light Purple: 31.2 - 33.7
- Medium Blue: 35.0 - 40.7
- Dark Blue: 43.2 - 45.1

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Map showing the projected median age of the total population in different regions of the United States.
The dependency ratio generally compares the non-working age population (youths and elderly) to the working age population. A dependency ratio of 0.6, for example, means that there are 6 dependents for every 10 working-age people. A high dependency ratio may indicate the need for social infrastructure ranging from schools and teachers to health care facilities. At the same time, a high dependency ratio may point to an age structure that constrains a tax base needed to support such infrastructure. Interestingly, counties with a high dependency ratio may have populations on both ends of the age spectrum with significant time and flexibility to visit a park during off-peak periods, such as during the week and after school. Within the Canyon de Chelly NM region, the dependency ratio (2000) ranges from 0.47 (La Plata) to 0.91 (San Juan, UT).
Dependency Ratio

ratio of population <18 or >64 to 18 - 64 years old (2000)

- Light blue: 0.47 - 0.64
- Light cyan: 0.71 - 0.72
- Medium blue: 0.81 - 0.83
- Dark blue: 0.88 - 0.91

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Canyon de Chelly National Monument and Region
General Population
Earnings by industry 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 Canyon de Chelly NM region (1999), the leading sector of earnings in all 8 counties is sales and services. The second-ranking sector is most frequently government.  

<table>
<thead>
<tr>
<th>% total earnings by industrial category (1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;NR</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Apache</td>
</tr>
<tr>
<td>Dolores</td>
</tr>
<tr>
<td>La Plata</td>
</tr>
<tr>
<td>McKinley</td>
</tr>
<tr>
<td>Montezuma</td>
</tr>
<tr>
<td>Navajo</td>
</tr>
<tr>
<td>San Juan, UT</td>
</tr>
<tr>
<td>San Juan, NM</td>
</tr>
</tbody>
</table>

Percentages may not add to one hundred due to rounding.
Earnings by Industry

% total earnings by industrial category (1999)

- Agriculture and Natural Resources
- Construction and Manufacturing
- Sales and Services
- Government

Canyon de Chelly National Monument and Region
One indicator of the way a particular county’s job market is structured is the percentage 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 Canyon de Chelly NM region (1999), the leading sector of employment in all 8 counties is sales and services. The second-ranking sector is most frequently government. 

<table>
<thead>
<tr>
<th></th>
<th>A&amp;NR</th>
<th>C&amp;M</th>
<th>S&amp;S</th>
<th>GOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>2</td>
<td>6</td>
<td>61</td>
<td>31</td>
</tr>
<tr>
<td>Dolores</td>
<td>31</td>
<td>6</td>
<td>43</td>
<td>20</td>
</tr>
<tr>
<td>La Plata</td>
<td>5</td>
<td>14</td>
<td>69</td>
<td>12</td>
</tr>
<tr>
<td>McKinley</td>
<td>4</td>
<td>9</td>
<td>63</td>
<td>24</td>
</tr>
<tr>
<td>Montezuma</td>
<td>9</td>
<td>16</td>
<td>62</td>
<td>14</td>
</tr>
<tr>
<td>Navajo</td>
<td>5</td>
<td>12</td>
<td>63</td>
<td>21</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>13</td>
<td>12</td>
<td>48</td>
<td>28</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>11</td>
<td>12</td>
<td>63</td>
<td>15</td>
</tr>
<tr>
<td>National</td>
<td>4</td>
<td>17</td>
<td>65</td>
<td>14</td>
</tr>
<tr>
<td>Arizona</td>
<td>3</td>
<td>15</td>
<td>69</td>
<td>13</td>
</tr>
<tr>
<td>Colorado</td>
<td>4</td>
<td>15</td>
<td>68</td>
<td>13</td>
</tr>
<tr>
<td>New Mexico</td>
<td>5</td>
<td>11</td>
<td>63</td>
<td>20</td>
</tr>
<tr>
<td>Utah</td>
<td>3</td>
<td>17</td>
<td>65</td>
<td>14</td>
</tr>
</tbody>
</table>

Percentages may not add to one hundred due to rounding.

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

% employment by industrial category (1999)

- Agriculture and Natural Resources
- Construction and Manufacturing
- Sales and Services
- Government

0 20 40 60 80 100%
Projected Change in Employment by Industry

Jobs in the four industrial sectors are in a constant state of flux. A projected decline or increase in a certain industrial sector may show which skills could be in demand at a future date. This could lead to a change in migration patterns in the counties around the park as new people arrive to take advantage of the new employment opportunities. Within the Canyon de Chelly NM region (2000 - 2020), 6 counties show the greatest projected increase in employment in sales and services. 

<table>
<thead>
<tr>
<th>County</th>
<th>A&amp;NR</th>
<th>C&amp;M</th>
<th>S&amp;S</th>
<th>GOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
<td>2</td>
<td>63</td>
<td>39</td>
<td>31</td>
</tr>
<tr>
<td>Dolores</td>
<td>2</td>
<td>15</td>
<td>38</td>
<td>29</td>
</tr>
<tr>
<td>La Plata</td>
<td>3</td>
<td>67</td>
<td>51</td>
<td>38</td>
</tr>
<tr>
<td>McKinley</td>
<td>8</td>
<td>14</td>
<td>51</td>
<td>26</td>
</tr>
<tr>
<td>Montezuma</td>
<td>6</td>
<td>29</td>
<td>59</td>
<td>34</td>
</tr>
<tr>
<td>Navajo</td>
<td>29</td>
<td>46</td>
<td>61</td>
<td>57</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>2</td>
<td>26</td>
<td>67</td>
<td>47</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>11</td>
<td>11</td>
<td>42</td>
<td>33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region</th>
<th>A&amp;NR</th>
<th>C&amp;M</th>
<th>S&amp;S</th>
<th>GOV</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>8</td>
<td>10</td>
<td>33</td>
<td>23</td>
</tr>
<tr>
<td>Arizona</td>
<td>22</td>
<td>26</td>
<td>62</td>
<td>43</td>
</tr>
<tr>
<td>Colorado</td>
<td>16</td>
<td>33</td>
<td>42</td>
<td>27</td>
</tr>
<tr>
<td>New Mexico</td>
<td>12</td>
<td>24</td>
<td>40</td>
<td>28</td>
</tr>
<tr>
<td>Utah</td>
<td>11</td>
<td>36</td>
<td>59</td>
<td>32</td>
</tr>
</tbody>
</table>

A&NR = Agriculture and Natural Resources
C&M = Construction and Manufacturing
S&S = Sales and Services
GOV = Government
Projected Change in Employment by Industry

Projected % change in employment by industrial category (2000 - 2020)

- Agriculture and Natural Resources
- Construction and Manufacturing
- Sales and Services
- Government

0 20 40 60 80 100 %
Poverty

Poverty is officially defined as the condition of living in a household with income below the federally-determined poverty threshold ($17,029 in 1999 for a family of four people). The extent of poverty can be measured as the percentage of the total population living below that threshold. Those living in poverty can face such difficulties as finding adequate housing and health care, getting enough food, and reaching job sites and government services, including parks. The level of poverty in the park region necessarily becomes significant to park management decisions and priorities. Within the Canyon de Chelly NM region, the incidence of poverty (1999) ranges from 11.7% (La Plata) to 37.8% (Apache).
Canyon de Chelly National Monument and Region

Poverty

% total population in poverty (1999)
- 11.7 - 13.1
- 16.4 - 21.5
- 29.5 - 31.4
- 36.1 - 37.8

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Economy and Commerce
Unemployment

The unemployment rate is one measure of participation in the civilian labor force. Jobs are of critical importance to individuals, families, and communities. Low unemployment rates indicate that the supply of jobs is sufficient to meet demand. Higher employment rates suggest that local economies may be too weak to support demand, or that the skills required for available jobs do not match those of the labor force, and local economies may be undergoing some transformation. A situation of high unemployment may generate stress within households and communities. 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 Canyon de Chelly NM region, unemployment (1999) ranges from 5.7% (La Plata) to 21.8% (Apache).10

<table>
<thead>
<tr>
<th>% of civilian labor force unemployed (1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Plata</td>
</tr>
<tr>
<td>Dolores</td>
</tr>
<tr>
<td>Montezuma</td>
</tr>
<tr>
<td>San Juan, NM</td>
</tr>
<tr>
<td>Navajo</td>
</tr>
<tr>
<td>San Juan, UT</td>
</tr>
<tr>
<td>McKinley</td>
</tr>
<tr>
<td>Apache</td>
</tr>
</tbody>
</table>

National = 5.8
Arizona = 5.6
Colorado = 4.3
New Mexico = 7.3
Utah = 5.0
Unemployment

% of civilian labor force unemployed (1999)
- 5.7 - 6.1
- 6.9 - 9.1
- 12.3 - 15.1
- 17.2 - 21.8

This map shows the unemployment rates in the specified regions. The areas are color-coded to indicate the percentage of the civilian labor force that was unemployed in 1999. The major cities and towns are marked on the map, along with the major highways and state boundary.
Median Household Income

Median household income is indicative of the general level of income among households in a county. The median value is the central value in a ranked dataset, with an equal number of observations both above and below the median. General income measures can provide insights into the opportunities and time available for recreation in the park region. Within the Canyon de Chelly NM region, median household income (1999) ranges from $23,344 (Apache) to $40,159 (La Plata).
Median Household Income

median household income ($) (1999)
- 23,344 - 25,005
- 28,137 - 28,569
- 32,083 - 32,196
- 33,762 - 40,159

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Racial Diversity

Racial diversity is measured as the percentage of the population belonging to minority groups. In the current U.S. context, “minority” races are 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 Canyon de Chelly NM region, the percentage of racial minorities (2000) ranges from 4.7% (Dolores) to 83.6% (McKinley).¹¹

<table>
<thead>
<tr>
<th>Location</th>
<th>Minority Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>4.7</td>
</tr>
<tr>
<td>La Plata</td>
<td>12.7</td>
</tr>
<tr>
<td>Montezuma</td>
<td>18.3</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>47.2</td>
</tr>
<tr>
<td>Navajo</td>
<td>54.1</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>59.2</td>
</tr>
<tr>
<td>Apache</td>
<td>80.5</td>
</tr>
<tr>
<td>McKinley</td>
<td>83.6</td>
</tr>
</tbody>
</table>

National = 24.9  Arizona = 24.5  Colorado = 17.2  New Mexico = 33.2  Utah = 10.8

![Number Line showing distribution of data](image-url)
Racial Diversity

% total population belonging to minority race groups (2000)

- 4.7 - 12.7
- 18.3 - 47.2
- 54.1 - 59.2
- 80.5 - 83.6

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Educational attainment indicators measure the average amount of formal education that a county’s residents have received. One indicator of educational attainment is the percentage of adults who have attended or graduated from college. Educational attainment influences many aspects of life, such as how much money people earn, what they do for recreation, where they get their information, and how they participate in civic life. With regard to park management, the educational attainment of the general public is an important consideration in activities, such as marketing, public participation processes, and the design of interpretive programs. Within the Canyon de Chelly NM region, the percentage of adults with some college education (2000) ranges from 32.0% (McKinley) to 56.2% (La Plata).12

<table>
<thead>
<tr>
<th>County</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>McKinley</td>
<td>32.0</td>
</tr>
<tr>
<td>Apache</td>
<td>34.7</td>
</tr>
<tr>
<td>Navajo</td>
<td>38.6</td>
</tr>
<tr>
<td>Dolores</td>
<td>39.3</td>
</tr>
<tr>
<td>Montezuma</td>
<td>39.6</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>41.6</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>42.1</td>
</tr>
<tr>
<td>La Plata</td>
<td>56.2</td>
</tr>
<tr>
<td>National</td>
<td>42.9</td>
</tr>
<tr>
<td>Arizona</td>
<td>48.3</td>
</tr>
<tr>
<td>Colorado</td>
<td>52.6</td>
</tr>
<tr>
<td>New Mexico</td>
<td>42.4</td>
</tr>
<tr>
<td>Utah</td>
<td>54.9</td>
</tr>
</tbody>
</table>

![Number Line showing distribution of data](image-url)
% total population 25 years old and over with some college or college degree (2000)

- 32.0 - 34.7
- 38.6 - 39.3
- 39.6 - 41.6
- 42.1 - 56.2

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Family Size

Family size is a measure of the average number of people in a family. A family is a group of two or more people who reside together and who are related by birth, marriage, or adoption. Families with a large number of people may include children and relatives of any age. With regard to park management, family size may affect patterns of use within the park and demands on services. It can also be an important consideration in such activities as marketing and the design of interpretive programs. Within the Canyon de Chelly NM region, the average number of persons per family (2000) ranges from 2.8 (Dolores) to 4.0 in 3 counties.
Family Size

average number of persons per family (2000)

- Light purple: 2.8 - 2.9
- Light purple: 3.0 - 3.4
- Medium purple: 3.7
- Dark purple: 4.0

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Crime indicators measure the frequency of various types of lawbreaking. One commonly used crime indicator is the number of serious crimes reported per 100,000 people. Serious crimes refer to murder and non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny-theft, arson, and motor vehicle theft. A high crime rate has many impacts on the general population, such as higher insurance rates and a reduced sense of security. Crime also affects government by increasing the demand for police, court services, and prisons. Crime presents direct challenges to park management, as the protection of visitors, park property, and resources becomes a greater priority. Within the Canyon de Chelly NM region, the number of serious crimes reported per 100,000 people (2000) ranges from 860 (San Juan, UT) to 5,094 (McKinley).
number of serious crimes per 100,000 people (2000)

- Light purple: 860 - 893
- Medium purple: 1,844 - 2,556
- Dark purple: 2,968 - 3,515
- Very dark purple: 3,578 - 5,094
Recreation and Tourism

Recreation/Tourism Establishments

The recreation and tourism industry is measured using two categories: the arts, entertainment and recreation sector (ranging from museums and concerts, to sporting events and amusement parks) and the accommodation subsector of the accommodation and food services sector (ranging from hotels to campsites). The size of these sectors is a broad indicator of a county’s economic reliance on recreation and tourism relative to the other sectors of the economy. Recreation and 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 and 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 Canyon de Chelly NM region, the percentage of total establishments in arts, entertainment, recreation, and accommodation (2001) ranges from 2.0% (San Juan, NM) to 9.8% (San Juan, UT).\(^{13}\)

% of total establishments in arts, entertainment, recreation, and accommodation services (2001)

<table>
<thead>
<tr>
<th>County</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Juan, NM</td>
<td>2.0</td>
</tr>
<tr>
<td>McKinley</td>
<td>4.4</td>
</tr>
<tr>
<td>La Plata</td>
<td>4.8</td>
</tr>
<tr>
<td>Apache</td>
<td>5.3</td>
</tr>
<tr>
<td>Navajo</td>
<td>5.3</td>
</tr>
<tr>
<td>Montezuma</td>
<td>5.5</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>9.8</td>
</tr>
<tr>
<td>Dolores</td>
<td>N/A</td>
</tr>
</tbody>
</table>

National = 2.3  
Arizona = 2.3  
Colorado = 2.6  
New Mexico = 3.2  
Utah = 2.2
% of total establishments in arts, entertainment, recreation, and accommodation services (2001)

- 2.0 - 4.4
- 4.8
- 5.3
- 5.5 - 9.8
- no data available

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

0 20 40 60 80 100
miles

Canyon de Chelly National Monument and Region
Recreation and Tourism

Recreation/Tourism Establishments
Recreation and tourism revenue is a key indicator of the economic importance of recreation and tourism to a county. Recreation and tourism revenue can be expressed as a percentage of total sales and service receipts. Recreation and 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 Canyon de Chelly NM region, the percentage of total sales from arts, entertainment, recreation, and accommodation services (1997) ranges from 0.1% (San Juan, UT) to 10.2% (Apache).14

<table>
<thead>
<tr>
<th>County</th>
<th>% of total sales from arts, entertainment, recreation, and accommodation services (1997)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Juan, UT</td>
<td>0.1</td>
</tr>
<tr>
<td>Montezuma</td>
<td>0.2</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>0.4</td>
</tr>
<tr>
<td>McKinley</td>
<td>0.4</td>
</tr>
<tr>
<td>La Plata</td>
<td>1.9</td>
</tr>
<tr>
<td>Navajo</td>
<td>5.2</td>
</tr>
<tr>
<td>Apache</td>
<td>10.2</td>
</tr>
<tr>
<td>Dolores</td>
<td>N/A</td>
</tr>
</tbody>
</table>

| National       | 1.1                                                                                     |
| Arizona        | 2.1                                                                                     |
| Colorado       | 1.8                                                                                     |
| New Mexico     | 1.6                                                                                     |
| Utah           | 1.1                                                                                     |

Number Line showing distribution of data
Recreation/Tourism Revenue

% of total sales from arts, entertainment, recreation, and accommodation services (1997)

- 0.1 - 0.2
- 0.4
- 1.9 - 5.2
- 10.2
- no data available

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Canyon de Chelly National Monument and Region

Recreation and Tourism

UTAH

ARIZONA

NEW MEXICO

COLORADO

Saydown: Recreation and Tourism Revenue

53
The significance of the recreation/tourism industry to a county economy can be indicated by the percentage of county workers that it employs. Workers counted as recreation and tourism employees include country club managers, blackjack dealers, campground employees, fishing guides, motel attendants, and other providers of recreation 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 Canyon de Chelly NM region, the percentage of total paid employees in arts, entertainment, recreation, and accommodation services (2001) ranges from 2.2% (San Juan, NM) to 18.2% (McKinley).15

<table>
<thead>
<tr>
<th>County</th>
<th>% of total paid employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Juan, NM</td>
<td>2.2</td>
</tr>
<tr>
<td>Navajo</td>
<td>5.1</td>
</tr>
<tr>
<td>Montezuma</td>
<td>10.7</td>
</tr>
<tr>
<td>La Plata</td>
<td>12.4</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>13.8</td>
</tr>
<tr>
<td>Apache</td>
<td>18.0</td>
</tr>
<tr>
<td>McKinley</td>
<td>18.2</td>
</tr>
<tr>
<td>Dolores</td>
<td>N/A</td>
</tr>
</tbody>
</table>

National = 3.1
Arizona = 4.1
Colorado = 4.1
New Mexico = 4.9
Utah = 3.4
Recreation/Tourism Employment

% of total paid employees in arts, entertainment, recreation, and accommodation services (2001)

- 2.2 - 5.1
- 10.7 - 12.4
- 13.8 - 18.0
- 18.2
- no data available

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
Congressional districts form a key layer in the political structure of a region of interest for a park. 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 Canyon de Chelly NM region includes parts of 6 Congressional districts. These districts are based on Census 2000.
Federal Expenditures

The importance of the federal government to a county economy can be indicated by the amount of federal expenditures per person. 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 Canyon de Chelly NM region, federal expenditures per person (2002) range from $3,672 (La Plata) to $12,144 (Apache).\(^{16}\)

<table>
<thead>
<tr>
<th>County</th>
<th>Federal Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>La Plata</td>
<td>$3,672</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>$4,824</td>
</tr>
<tr>
<td>Montezuma</td>
<td>$5,369</td>
</tr>
<tr>
<td>Dolores</td>
<td>$6,029</td>
</tr>
<tr>
<td>Navajo</td>
<td>$6,794</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>$6,839</td>
</tr>
<tr>
<td>McKinley</td>
<td>$6,849</td>
</tr>
<tr>
<td>Apache</td>
<td>$12,144</td>
</tr>
</tbody>
</table>

Federal Expenditures per capita ($)(2002)

<table>
<thead>
<tr>
<th>Region</th>
<th>Federal Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>$6,650</td>
</tr>
<tr>
<td>Arizona</td>
<td>$6,371</td>
</tr>
<tr>
<td>Colorado</td>
<td>$5,820</td>
</tr>
<tr>
<td>New Mexico</td>
<td>$9,422</td>
</tr>
<tr>
<td>Utah</td>
<td>$5,311</td>
</tr>
</tbody>
</table>
Canyon de Chelly National Monument and Region

Federal Expenditures

Federal expenditures per capita ($) (2002)

- Light Pink: 3,672 - 4,824
- Light Purple: 5,369 - 6,029
- Purple: 6,794 - 6,839
- Dark Purple: 6,849 - 12,144

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Map showing federal expenditures per capita in the Canyon de Chelly National Monument and Region, with different shades representing different expenditure ranges.

Map legend includes major cities and town names such as Chaco, Bluff, and others.

Canyon de Chelly National Monument and Region

40 60 80 100

0 20 miles
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, recreation, 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 addressed effectively at the ecoregion level.

The Canyon de Chelly NM region includes parts of four ecoregion divisions described below. The majority of the region is classified as Tropical/Subtropical Steppe.

Bailey’s Ecoregions

Tropical/Subtropical Steppe – climate is hot and semi-arid, and potential evaporation is greater than precipitation. The presence of plateaus and high plains and associated, localized variation in altitude produces a semi-arid steppe climate. Steppes are grasslands with short grasses, herbs, and locally developed shrub and woodland. Limited grazing can be supported, but crop cultivation requires irrigation.

Tropical/Subtropical Steppe Regime Mountains – climate is affected by variation in elevation with higher temperatures in the foothills and lower temperatures on the upper mountain slopes. Average annual precipitation increases with elevation. Precipitation occurs during the summer, fall, and winter. In the mountains, precipitation falls as snow. Vegetation also varies with altitudinal zone. At lower elevations, vegetation is characterized by mixed grasses, chaparral brush, oak-juniper woodland, and pinyon-juniper woodland. With increasing elevation, open forests of ponderosa pine are found. At even higher elevations, Douglas-fir grows on northfacing slopes and aspen is common. Engelmann spruce and corkbark fir can be found at the highest elevations.

Temperate Steppe – climate is characterized as semi-arid continental, where evaporation is usually greater than precipitation. Summers are warm to hot, and winters are cold. The vegetation is steppe and semi-desert. Typical steppe vegetation includes short grasses that grow in dispersed bunches, shrubs, and low trees. Buffalo grass, sunflower, and locoweed are typical. Semi-desert vegetation includes xerophytic shrubs, such as sagebrush.

Temperate Desert – climate is characterized by strong temperature differences between summer and winter and low rainfall. Most precipitation occurs in the winter. Unlike deserts at lower latitudes, these deserts have a greater annual temperature range and part of the precipitation is in the form of snow. Xerophytic shrub vegetation is found in these areas.
Federal Land Management

One indicator of the federal government’s role in regional resource management is the amount of land under federal management. 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, education, 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 Canyon de Chelly NM region, land under federal management (2004) ranges from 9.1% (Apache) to 61.8% (Dolores).18

<table>
<thead>
<tr>
<th>% land under federal management (2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apache</td>
</tr>
<tr>
<td>Navajo</td>
</tr>
<tr>
<td>McKinley</td>
</tr>
<tr>
<td>San Juan, NM</td>
</tr>
<tr>
<td>Montezuma</td>
</tr>
<tr>
<td>La Plata</td>
</tr>
<tr>
<td>San Juan, UT</td>
</tr>
<tr>
<td>Dolores</td>
</tr>
</tbody>
</table>

National = 27.2
Arizona = 38.3
Colorado = 35.6
New Mexico = 29.1
Utah = 62.4
Federal Land Management

% land under federal management (2004)

- 9.1 - 9.5
- 12.1 - 24.4
- 36.2 - 40.1
- 61.1 - 61.8

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Canyon de Chelly National Monument and Region

Utah Arizona New Mexico

Map showing the percentage of land under federal management (2004) with different color ranges indicating varying percentages. Major cities and towns are marked on the map.
Federal Lands and Indian Reservations

National park units, administered by the National Park Service, are part of a larger system of public lands. Other federal agencies that administer public lands include the Bureau of Land Management, Bureau of Reclamation, Department of Defense, U.S. Fish and Wildlife Service, and U.S. Forest Service. Indian reservations are also an important part of the landscape. Public land managed by one federal agency may share boundaries with land managed by a different federal agency or with an Indian reservation. Understanding the location and pattern of federal lands (by agency) and Indian reservations can help park managers and others in the region cooperate on resource protection and planning issues.  

Canyon de Chelly NM, though a unit of the National Park System, consists entirely of tribal trust land.
Federal Lands and Indian Reservations

federal lands and Indian reservations (2000)

- Indian Reservations
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- U.S. Forest Service
- National Park Service

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Canyon de Chelly National Monument and Region

Land Use
Farmland

The relative importance of farming within a county can be indicated by the percentage of the county’s total land area that is classified as farmland. Farming includes crop cultivation as well as pasturing and grazing of livestock. Because damaged or degraded natural resources present a long-term threat to the health and profitability of farming, farm operators are potentially key partners in local and regional resource protection issues. Park management can require close coordination with area farmers on many issues, such as control of non-native species, species reintroduction, preservation of scenic values, allocation of scarce water supplies, or management of agricultural runoff. Within the Canyon de Chelly NM region, the percentage of total county land area classified as farmland (1997) ranges from 22.8% (Dolores) to 90.5% (McKinley).20

<table>
<thead>
<tr>
<th>County</th>
<th>% Land Classified as Farmland (1997)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>22.8</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>33.4</td>
</tr>
<tr>
<td>La Plata</td>
<td>53.6</td>
</tr>
<tr>
<td>Navajo</td>
<td>61.3</td>
</tr>
<tr>
<td>Montezuma</td>
<td>71.8</td>
</tr>
<tr>
<td>McKinley</td>
<td>90.5</td>
</tr>
<tr>
<td>Apache</td>
<td>N/A</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>N/A</td>
</tr>
</tbody>
</table>

National = 41.2
Arizona = 36.9
Colorado = 49.2
New Mexico = 58.9
Utah = 22.9
% land classified as farmland (1997)

- 22.8 - 33.4
- 53.6 - 61.3
- 71.8
- 90.5
- no data available

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary
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 growers elsewhere, loss of labor, or conversion of land to other (often urban) uses. Within the Canyon de Chelly NM region (1987 - 1997), the change ranged from a decrease of 49.2% (Navajo) to an increase of 391.4% (San Juan, UT).  

<table>
<thead>
<tr>
<th>County</th>
<th>% change in acres of farmland (1987 - 1997)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navajo</td>
<td>-49.2</td>
</tr>
<tr>
<td>La Plata</td>
<td>-5.5</td>
</tr>
<tr>
<td>Dolores</td>
<td>-2.6</td>
</tr>
<tr>
<td>McKinley</td>
<td>6.7</td>
</tr>
<tr>
<td>Montezuma</td>
<td>10.8</td>
</tr>
<tr>
<td>San Juan, UT</td>
<td>391.4</td>
</tr>
<tr>
<td>Apache</td>
<td>N/A</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>N/A</td>
</tr>
<tr>
<td>National</td>
<td>-3.4</td>
</tr>
<tr>
<td>Arizona</td>
<td>-26.0</td>
</tr>
<tr>
<td>Colorado</td>
<td>-4.2</td>
</tr>
<tr>
<td>New Mexico</td>
<td>-0.5</td>
</tr>
<tr>
<td>Utah</td>
<td>20.4</td>
</tr>
</tbody>
</table>

2.1
Change in Farmland

% change in acres of farmland (1987 - 1997)

- 49.2
- 5.5 - 2.6
- 6.7 - 10.8
- 391.4
- no data available

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

Map showing the regions of Arizona and Utah with major cities and towns marked. The map also indicates different color codes for the percentage change in farmland.
Maps of metropolitan areas show park managers densely populated urban areas that are near national park units. The Census Bureau defines a metropolitan area (MA) as having a large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that nucleus. MAs are single counties or aggregations of counties. Most counties in MAs include both urban and rural land uses. For this map, a larger region around Canyon de Chelly NM is provided to show the extent of nearby MAs, though there are no MAs in the park region.\textsuperscript{22}
Land Use

Metropolitan Areas

Canyon de Chelly National Monument and Region

metropolitan areas (1999)

- MAs
- State Boundary
- State Boundary through MA
- County Boundary
- Region of Interest

0 50 100 150 200

miles
Urbanization is a measure of the degree to which counties are associated with metropolitan areas based on population and commuting patterns. 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 (not near metro area and small population size) to large metropolitan. Within the Canyon de Chelly NM region (2003), 7 of the 8 counties are classified as nonmetropolitan.23

<table>
<thead>
<tr>
<th>County</th>
<th>Level of Urbanization (2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Juan, UT</td>
<td>11</td>
</tr>
<tr>
<td>Dolores</td>
<td>10</td>
</tr>
<tr>
<td>Apache</td>
<td>6</td>
</tr>
<tr>
<td>Montezuma</td>
<td>6</td>
</tr>
<tr>
<td>Navajo</td>
<td>6</td>
</tr>
<tr>
<td>La Plata</td>
<td>5</td>
</tr>
<tr>
<td>McKinley</td>
<td>5</td>
</tr>
<tr>
<td>San Juan, NM</td>
<td>2</td>
</tr>
</tbody>
</table>
Urbanization

level of urbanization (2003)

- **level 11** (most rural)
- **level 10**
- **level 6**
- **level 5**
- **level 2** (most urban)

- Major Cities
- Other Cities and Towns
- Major Highways
- State Boundary

---

**Canyon de Chelly National Monument and Region**

**Utah**

**Arizona**

**New Mexico**

---

**Map Legend**

0 20 40 60 80 100

miles
Watersheds

Watersheds are delineated by the U.S. Geological Survey using a nationwide system based on surface hydrological features. Watersheds are increasingly serving as the geographical units within which governments, institutions, and citizens organize to carry out initiatives for environmental protection and restoration. Familiarity with watershed boundaries is fundamental in developing educational programs and in mobilizing constituencies to protect water quality throughout the park region. The Canyon de Chelly NM region includes all or portions of nine basins.

24
Canyon de Chelly National Monument and Region

Watersheds

basins
- Little Colorado
- Lower Green
- Lower San Juan
- Rio Grande-Elephant Butte
- Salt
- Upper Colorado-Dirty Devil
- Upper Colorado-Dolores
- Upper Gila
- Upper San Juan

Source: [Map source URL]
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 Canyon de Chelly National Monument. 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 or economic shifts. 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 educational attainment among regional residents. This information could be helpful in designing interpretive and public participation programs and materials that can increase access to and understanding of the role of the park in the region. 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 Canyon de Chelly National Monument.
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 captions for the legends used in the maps and the ranked data tables.

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>MEASURE</th>
<th>DATA SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Total Population</td>
<td>total number of people (2003)</td>
<td>U.S. Department of Commerce, Census Bureau,</td>
</tr>
</tbody>
</table>
### Appendix 1: Data Sources for Indicators (continued)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>MEASURE</th>
<th>DATA SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected Median Age</td>
<td>projected median age of total population (2020)</td>
<td>Woods &amp; Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods &amp; Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. <a href="http://www.woodsandpoole.com">http://www.woodsandpoole.com</a></td>
</tr>
<tr>
<td>Dependency Ratio</td>
<td>ratio of population &lt;18 or &gt;64 to 18 - 64 years old (2000)</td>
<td>U.S. Department of Commerce, Census Bureau, <a href="http://factfinder.census.gov">http://factfinder.census.gov</a> – Census 2000 Summary File 1 (SF1) 100% Data, Table P12</td>
</tr>
<tr>
<td>Economy and Commerce</td>
<td></td>
<td>Woods &amp; Poole Economics, Inc. 2002 Complete Economic and Demographic Data Source (CEDDS) on CD-ROM. Washington, DC. Woods &amp; Poole Economics, Inc. provides long-term socioeconomic data projections at the state and local levels, in both hardcopy and electronic format. <a href="http://www.woodsandpoole.com">http://www.woodsandpoole.com</a></td>
</tr>
</tbody>
</table>
### Appendix 1: Data Sources for Indicators (continued)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>MEASURE</th>
<th>DATA SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>% of civilian labor force unemployed (1999)</td>
<td>U.S. Department of Commerce, Census Bureau, <a href="http://factfinder.census.gov">http://factfinder.census.gov</a> – Census 2000 Summary File 3 (SF3) Sample Data, Table PCT35</td>
</tr>
</tbody>
</table>

**Social and Cultural Characteristics**

| *Racial Diversity                                      | % total population belonging to minority race groups (2000)            | U.S. Department of Commerce, Census Bureau, [http://factfinder.census.gov](http://factfinder.census.gov) – Census 2000 Summary File 1 (SF1) 100% Data, Table P7 |
| *Educational Attainment                                 | % total population 25 years old and over with some college or college degree (2000) | U.S. Department of Commerce, Census Bureau, [http://factfinder.census.gov](http://factfinder.census.gov) – Census 2000 Summary File 3 (SF3) Sample Data, Table P37 |
| Family Size                                             | average number of persons per family (2000)                             | U.S. Department of Commerce, Census Bureau, [http://factfinder.census.gov](http://factfinder.census.gov) – Census 2000 Summary File 1 (SF1) 100% Data, Table P33 |
### Appendix 1: Data Sources for Indicators (continued)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>MEASURE</th>
<th>DATA SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>Ecoregions</td>
<td>1) USDA Forest Service, Inventory and Monitoring Institute, <a href="http://www.fs.fed.us/institute/ecoregions/eco_download.htm">http://www.fs.fed.us/institute/ecoregions/eco_download.htm</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) U.S. Department of Commerce, Census Bureau, <a href="http://www.census.gov/population/cen2000/atlas/all_00.xls">http://www.census.gov/population/cen2000/atlas/all_00.xls</a> (county square mile data to convert into acres)</td>
</tr>
</tbody>
</table>
## Appendix 1: Data Sources for Indicators (continued)

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>MEASURE</th>
<th>DATA SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservations</td>
<td></td>
<td><a href="http://nationalatlas.gov/atlasftp.html">http://nationalatlas.gov/atlasftp.html</a></td>
</tr>
<tr>
<td>Farmland</td>
<td>% land classified as farmland (1997)</td>
<td>U.S. Department of Agriculture, National Agricultural Statistics Service,</td>
</tr>
<tr>
<td>*Change in Farmland</td>
<td>% change in acres of farmland (1987 - 1997)</td>
<td>U.S. Department of Agriculture, National Agricultural Statistics Service,</td>
</tr>
<tr>
<td>*Metropolitan Areas</td>
<td>metropolitan areas (1999)</td>
<td>U.S. Department of Commerce, Census Bureau,</td>
</tr>
<tr>
<td>*Urbanization</td>
<td>level of urbanization (2003)</td>
<td>U.S. Department of Agriculture, Economic Research Service,</td>
</tr>
<tr>
<td>Watersheds</td>
<td>basins</td>
<td>U.S. Department of the Interior, U.S. Geological Survey,</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="http://www.nationalatlas.gov/hucsm.html">http://www.nationalatlas.gov/hucsm.html</a></td>
</tr>
</tbody>
</table>

* 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 in this atlas 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 rankings of data values among counties. The legend accompanying the map allows the reader to see the range of values among counties within a class. 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 3, 3, 3, and 2, with the last 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 Political Boundaries – The regional base map depicts the formally defined political boundaries of states and counties.

Map Sources – The regional map on the cover and at the beginning of the atlas was generated from the North American HYDRO1k dataset [http://edcdaac.usgs.gov/gtopo30/hydro/] developed at the U.S. Geological Survey’s EROS Data Center. The standard region of interest map used throughout the atlas was generated from U.S. Geological Survey shapefiles. Contextual information (roads and cities) was also obtained from the U.S. Geological Survey [http://www.nationalatlas.gov].

Production – Indicator data for the atlas were compiled in Microsoft Excel 2000. These were linked to U.S. Geological Survey shapefiles using ESRI ArcMap GIS 8.3. The GIS files were imported into Adobe Illustrator 10.0 for final map production.
Text Sources – Additional web resources used to prepare park and regional descriptions are:

- Southeast Utah; [http://www.southeastutah.com](http://www.southeastutah.com)
- The American Southwest; [http://www.americansouthwest.net](http://www.americansouthwest.net)
- Explore the Navajo Nation; [http://www.americanwest.com/pages/navajo2.htm](http://www.americanwest.com/pages/navajo2.htm)
- Four Corners Regional Study – Economies and Issues; [http://www.fortlewis.edu/shared/content_objects/san_juan_forum/4corners_regional_study.pdf](http://www.fortlewis.edu/shared/content_objects/san_juan_forum/4corners_regional_study.pdf)

### Appendix 3: Technical Notes on Measurement of Selected Indicators

1. Persons enumerated in the census were counted as inhabitants of their usual place of residence, which generally means the place where a person lives and sleeps most of the time. This place is not necessarily the same as the legal residence, voting residence, or domicile. In the vast majority of cases, however, the use of these different bases of classification would produce substantially the same statistics, although appreciable differences may exist for a few areas.

2. For an explanation of Woods & Poole’s projection methods see page 11 in the Woods and Poole Technical Documentation manual.

3. Population density is measured as the average number of people per square mile. This number is calculated by dividing the total number of people by the total area per county. In counties with federal lands, excluding these areas from the calculation of population density would result in a higher population density.

4. See note above on population density.

5. See note above on population density.

6. 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.

7 See note above on industry categories.

8 See note above on industry categories.

9 Poverty is measured as the percentage of the total population living below the poverty level. The poverty level is defined as earnings of $17,029 or less for a family of four persons (1999). Poverty thresholds are applied on a national basis and are not adjusted for regional, state, or local variations in the cost of living.

10 Unemployed persons include civilians 16 years old and over who had no employment during the reference week, made specific efforts to find a job within the previous 4 weeks, were available for work during that week, except for temporary illness. Persons laid off and expecting recall to a job also are classified as unemployed. All other civilian persons, 16 years old and over, are “not in the labor force.” The reference week is the full calendar week (Sunday through Saturday) preceding the date each respondent completed their Census 2000 questionnaire. This calendar week is not the same for all people since the enumeration was not completed in one week.

11 Racial diversity is defined for this measure as the percentage of the population classified 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 more “diverse” than a county in which each of the six major race groups constituted 10% of the population (in the latter case, diversity would be measured as 60%). The Hispanic or Latino origin category was not included in this measure because persons of Hispanic or Latino origin may be of any race (including White).

12 For Census 2000, persons are classified according to the highest level of school completed or the highest degree received.

13 Recreation and Tourism is composed of the arts, entertainment, and recreation sector and the accommodation subsector, both a part of the North American Industry Classification System (NAICS). The arts, entertainment, and recreation sector includes museums, historical sites, gambling and recreation industries, golf courses and country clubs, fitness and recreational sports centers, and all other amusement industries. The accommodation subsector is comprised of establishments including hotels, motels, bed and breakfasts, RV parks, recreational camps, and vacation camps. For a complete definition of these NAICS categories please consult http://www.census.gov/epcd/www/naics.html.
14 See note above on recreation/tourism.

15 See note above on recreation/tourism.

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


18 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 (tribal lands are not included). 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.

19 The U.S. Geological Survey produces the federal lands and Indian reservations map layer. This map layer does not include any federally and Indian held land that has an areal extent smaller than 640 acres. For more information and metadata, consult [http://www.nationalatlas.gov/fedlands.html](http://www.nationalatlas.gov/fedlands.html).

20 Farmland consists primarily of agricultural land used for crops, pasture, or grazing. Also included are woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm operator’s total operation. Farmland includes acres in the Conservation Reserve, Wetlands Reserve Programs, or other governmental programs. Farmland includes land owned and operated as well as land rented from others. Land used rent-free is included as land rented from others. All grazing land, except land used under government permits on a per-head basis, is included as farmland provided it is part of a farm or ranch. Land under the exclusive use of a grazing association is reported by the grazing association and included as farmland. All land in American Indian reservations used for growing crops or grazing livestock is included as farmland. Land in reservations not reported by individual American Indians or non-Native Americans is reported in the name of the cooperative group that used the land.

21 See note above on farmland.

22 Certain Metropolitan Areas (MAs) are defined around two or more nuclei. Each MA must contain either a place with a minimum population of 50,000 or a U.S. Census Bureau-defined urbanized area and a total MA population
of at least 100,000. For a complete definition, consult [http://www.census.gov/geo/www/cob/ma_metadata.html].

23 The Economic Research Service classifies counties according to their level of urbanization. The classification consists of twelve mutually-exclusive codes:

METROPOLITAN COUNTIES
1) In large metro area of greater than 1 million residents
2) In small metro area of less than 1 million residents

NONMETROPOLITAN COUNTIES
3) Micropolitan adjacent to large metro
4) Noncore adjacent to large metro
5) Micropolitan adjacent to small metro
6) Noncore adjacent to small metro with own town
7) Noncore adjacent to small metro, no own town
8) Micropolitan not adjacent to a metro area
9) Noncore adjacent to micro with own town
10) Noncore adjacent to micro with no own town
11) Noncore not adjacent to metro or micro with own town
12) Noncore not adjacent to metro or micro with no own town

24 Watersheds are delineated by the U.S. Geological Survey using a nationwide system based on surface hydrologic features and published in 1998. This system divides the country into 21 regions, 222 subregions, 352 accounting units, and 2,262 cataloging units. A hierarchical hydrologic code (HUC) consisting of 2 digits for each level in the hydrologic unit system is used to identify any hydrologic area. The 6-digit accounting units and 8-digit cataloging units are generally referred to as basins and sub-basin watersheds.
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