



A Look Ahead

Key Social and Environmental Forecasts
Relevant to the National Park Service



NPS Social Science Program

Prepared for

Discovery
2000

The National Park Service General Conference
September 11-15, 2000 • St. Louis, Missouri

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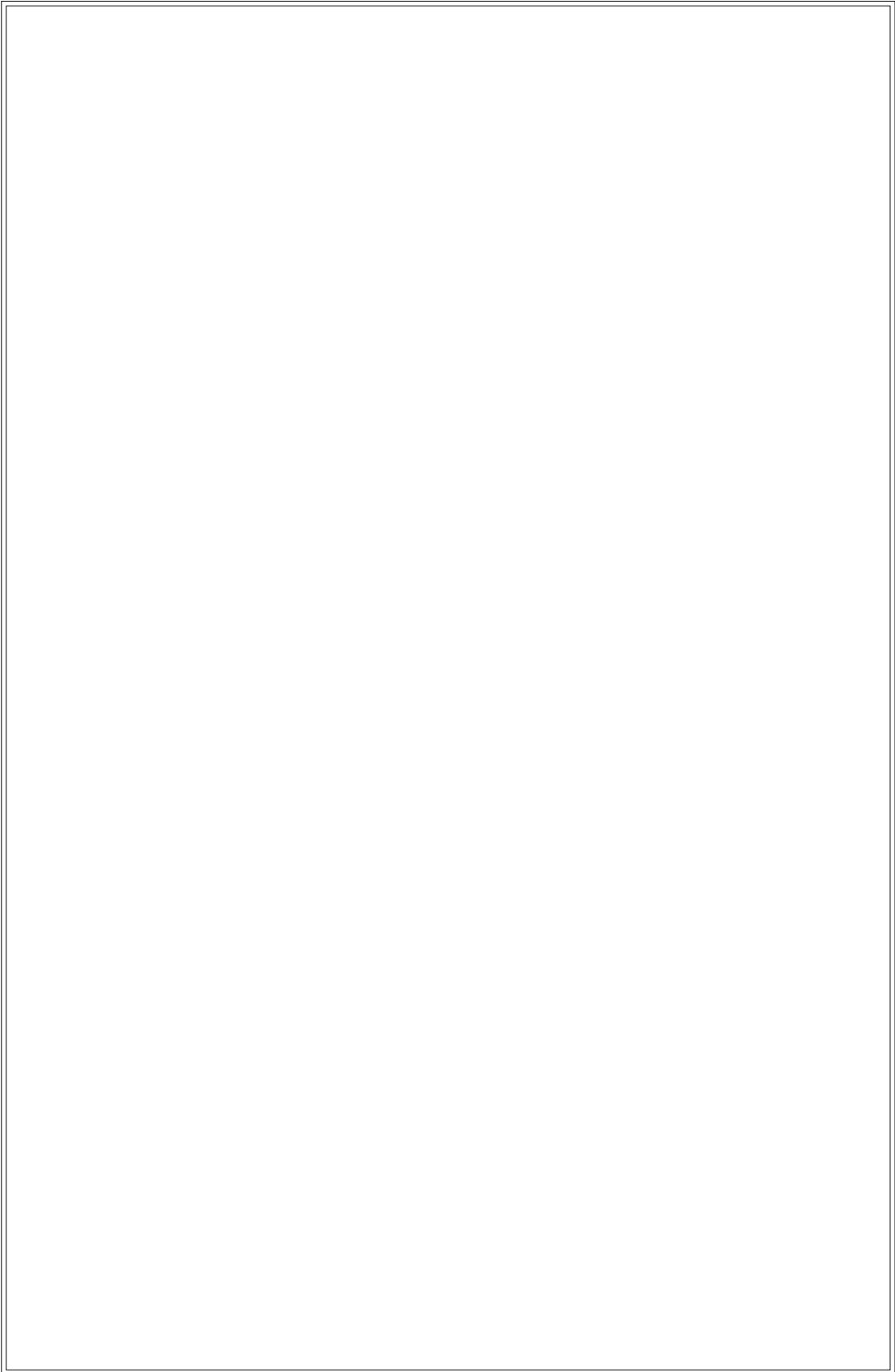
prepared for
Discovery 2000
The National Park Service General Conference
September 11-15, 2000
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by

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Preface

The National Park Service faces important challenges in the decade ahead. Beyond the milestone of the new millenium, our nation faces unprecedented social, technological, economic, environmental, and cultural change. And to the extent that the NPS and the National Park System are part of the American experience, these changes will profoundly influence our future. Managing the parks of the new century will require accurate understanding of changes occurring within and outside park boundaries. The ability to monitor contemporary trends, respond effectively using science-based decision making, and strive to preserve natural and cultural resources for the long-term, will be hallmarks of future park management.

As part of the Natural Resource Challenge, the NPS is increasing its ability to monitor ecosystem and natural resource trends—from water and air quality to exotic plants and animals. In addition, we are moving to create new tools to aid park managers in navigating amid present and future trends.

A Look Ahead, prepared for Discovery 2000, the NPS General Conference in St. Louis September 11-15, 2000, is one such tool. Created by the NPS Social Science Program, this brief report highlights key social and environmental forecasts relevant to the National Park Service. I encourage all participants of Discovery 2000, and all employees of the NPS, to examine the forecasts presented in *A Look Ahead*, and consider their implications for the challenges facing the NPS, and to our extraordinary mission.



Michael Soukup
Associate Director
Natural Resource Stewardship and Science

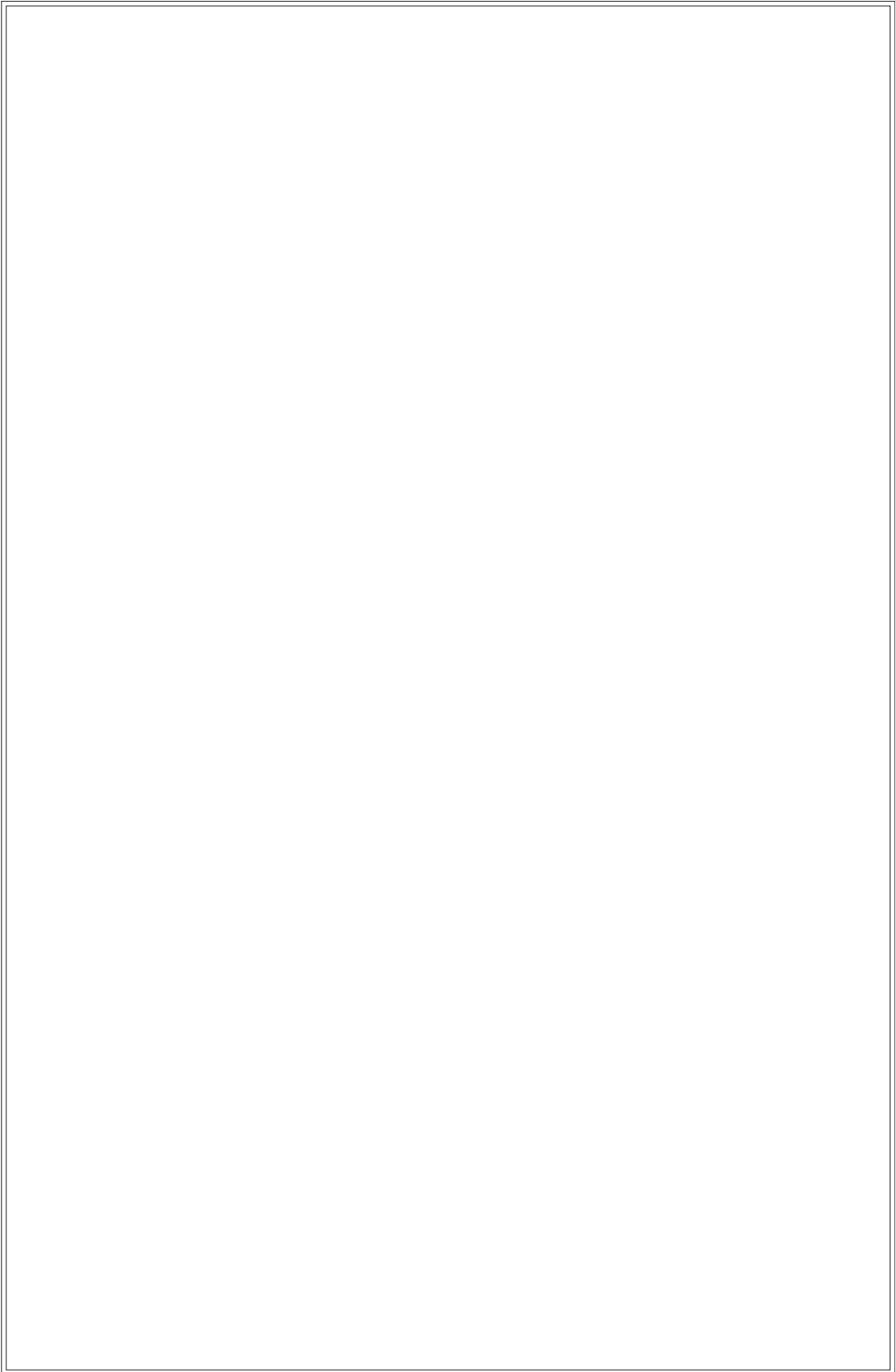


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Introduction

A Look Ahead was produced by the NPS Social Science Program to assist park managers by providing usable knowledge about the future. It includes information on the current condition and future forecast for a number of social and environmental indicators relevant to the National Park Service. These indicators represent what H.W. Odum (father of the ecologists E.P. and H.T. Odum) called “the basic facts.” Understanding these basic facts is essential to effective visioning of the future, one of the goals of Discovery 2000.

The indicators are grouped into five general categories: Demography, Technology, Economics, Environment, and Culture. These categories represent key “domains of the future” — each is a critical component of society that is likely to change over time. The domains often influence each other. For example, new technologies can lead to new markets (economic change) and create ecosystem stresses (environmental change).

Within each domain, several indicators are presented. For each indicator, data on both the current condition (ranging from 1990-2000) and near future (ranging from 2002-2030) are presented. The data included in this report are all available through the internet, popular literature and books, government reports, and other accessible sources.

Each indicator is presented on a separate page. For ease of use, each page is organized as follows:

- ◆ the **heading** clearly identifies the general domain and specific indicator,
- ◆ a brief **introduction** describes the indicator, its current condition and forecast,
- ◆ data on the current condition and forecast are presented in a graph or series of **graphs**,
- ◆ the **trend** over time (increase or decrease) is highlighted,
- ◆ the **significance** of the indicator to park management is suggested,
- ◆ “**surprise scenarios**,” or factors that could significantly alter the forecast, are suggested, and
- ◆ the **source** of the data is referenced.

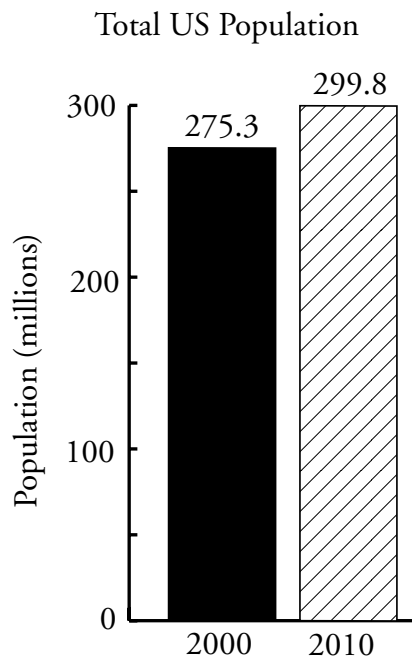
There are several limitations to this report. Most indicators were selected for the US, and global indicators are noted in the heading. Only indicators with specific and quantitative forecasts are included. While over 40 indicators are presented, there are numerous other indicators that could have been chosen. While the significance of the indicator to NPS park management is suggested, there are undoubtedly other interpretations of how and why these indicators are relevant to the NPS. The description of surprise scenarios is likely to be incomplete — it is the nature of future uncertainties that they are often overlooked in the present.

Nevertheless, *A Look Ahead* may be a useful tool for NPS managers and partners. It is a kind of “almanac of the future,” and can serve as a reference guide to trends that may significantly influence the future of the National Park Service. And it reminds us that in thinking about the future, the “basic facts” are both necessary and important.

Chapter One
Demography

Demography - General Population

The number of Americans is increasing. In 2000, there are 275.3 million individuals living in the US. An increase of 8.9% is expected, as the projected US population will reach 299.8 million by 2010.



Trend	US Population	+8.9%
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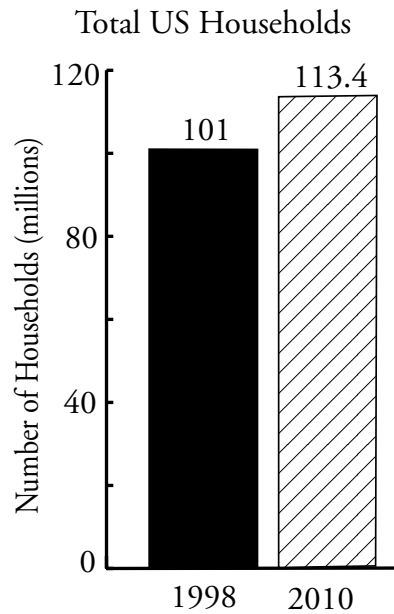
Significance	As the US population increases, so will visitation to NPS units. This can place pressure on resources, facilities, and services within and adjacent to parks. Nationally, population growth will continue to add to the demands placed on natural, cultural, and historical resources.
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Surprise Scenarios	Societal norms regarding family size can influence the annual birth rate. Medical technology and/or social policy can affect infant mortality, life expectancy, and immigration.
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Source	Population Estimates Program, Population Division. (1999). <i>United States Census Bureau</i> . http://www.census.gov/population/estimates/nation/intfile2-1.txt
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Demography - Households

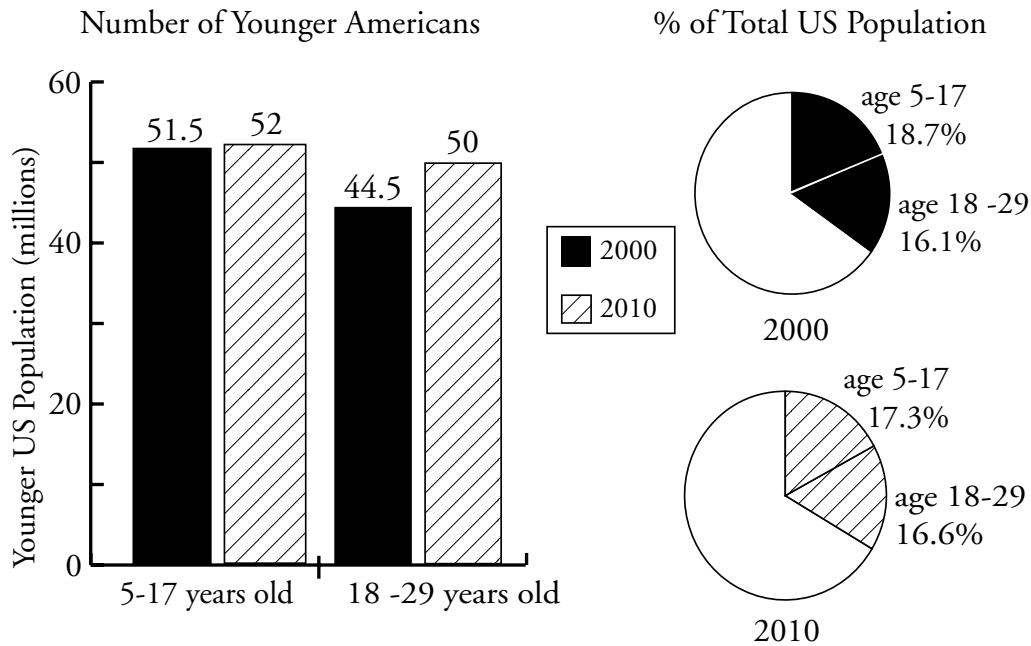
The number of households is an important indicator of the demand for land and other resources. In 1998, there were 101 million households in the US. This number is projected to increase 12.3% by 2010, to 113.4 million households.



Trend	Number of Households	+12.3%
Significance	New households place increasing pressure on natural resources such as land, timber, and water. These pressures may affect large-scale ecosystems. Since visitors often come to parks in household groups, an increase in visitation is likely.	
Surprise Scenarios	Social norms, environmental laws regulating development, and economic factors such as inflation, interest rates, and wages can influence the number of new households.	
Source	Population Projections Program, Population Division. (1998). <i>United States Census Bureau</i> . Washington, DC. Woods & Poole Economics, Inc. (1999). <i>The Complete Economic and Demographic Data Source</i> . Washington, DC.	

Demography - Younger Population

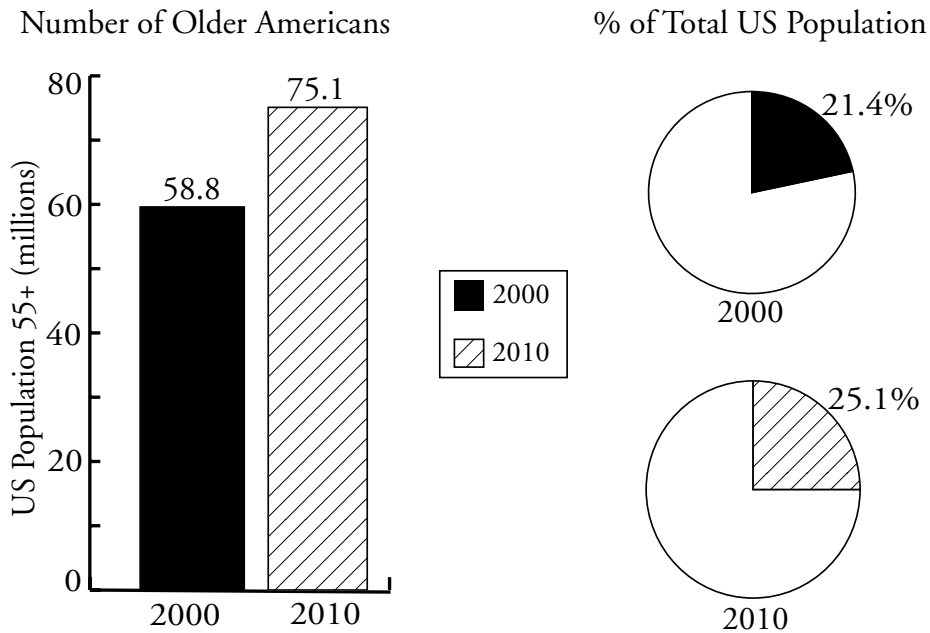
Youth (age 5-17) and young adults (age 18-29) are important demographic groups. Both are growing in number, but not in their proportion of the general population. In the near future the proportion of youth in the general population is expected to decline slightly, and the proportion of young adults is expected to remain relatively constant.



Trend	Number of Americans Age 5-17 +1.0% Number of Americans Age 18-29 +12.4% Change in Percentage of US Population Age 5-17 -1.4% Change in Percentage of US Population Age 18-29 +0.5%
Significance	Presence of children in visitor groups can influence activities of the entire group. Young adults use backcountry areas of parks at higher rates than other age groups. Children and young adults may be the focus of visitor services such as park interpretive programs, recreational activities, facilities, and concessionaire marketing.
Surprise Scenarios	Societal norms regarding family size may influence the annual birth rate.
Source	Population Estimates Program, Population Division. (1999). <i>United States Census Bureau</i> . http://www.census.gov/population/estimates/nation/intfile2-1.txt

Demography - Older Population

The population of Americans age 55 years or older is expected to be the fastest growing demographic group during the next decade. In 2000, they number 58.8 million individuals, or 21.4% of the total US population. An increase of 27.7% is predicted to occur by 2010, when the older population is projected to reach 75.1 million. Older Americans will then represent 25.1% of the total US population, an increase of 3.7% from 2000.



Trend	Number of Older Americans +27.7% Change in Percentage of US Population +3.7%
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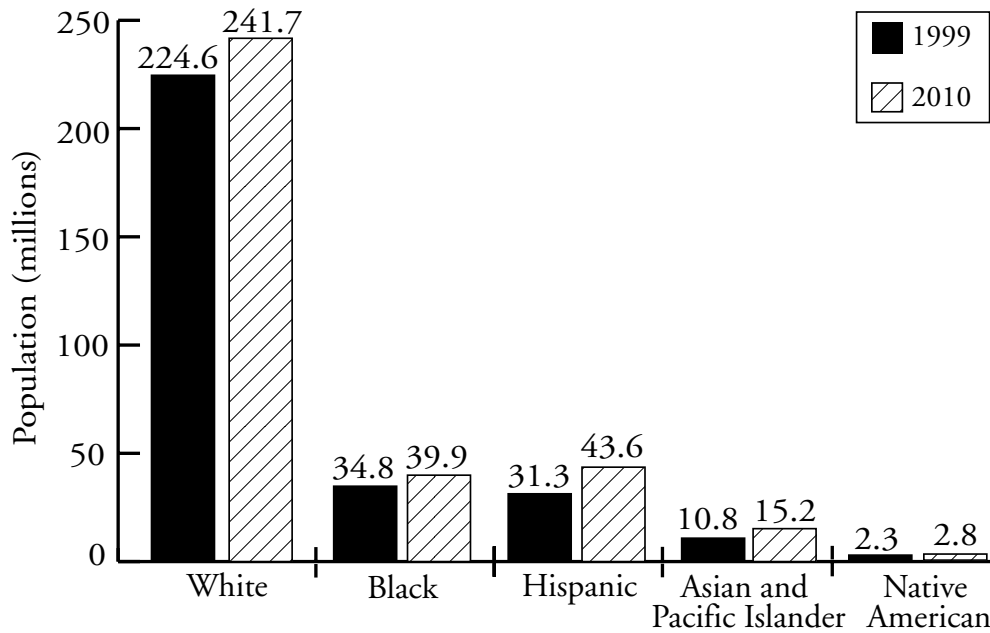
Significance	Americans 55 years old or older may have more leisure time and financial stability than other age groups. Many are park enthusiasts. They have unique recreational behavior and consumer spending patterns that often require special attention.
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Surprise Scenarios	With the advancement of medical technologies and improvement in health care, the population of Americans age 55 or older may grow higher than projected.
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Source	National Population Projections. (2000). <i>United States Census Bureau</i> http://www.census.gov/population/www/projections/natsum.html
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Demography - Ethnic Diversity

The five major race or ethnic groups in the US will experience varying degrees of population growth in the coming decade. Asian and Pacific Islanders will see the greatest degree of change, increasing 40.7% from 10.8 million in 1999 to a projected 15.2 million in 2010. The White (non-Hispanic) population will experience the smallest degree of change, increasing 7.6% from 224.6 million in 1999 to 241.7 million in 2010. The Hispanic population will become the largest minority group.



Trend	White	+7.6%	Asian and Pacific Islander	+40.7%
	Black	+14.7%	Native American	+21.7%
	Hispanic	+39.3%		

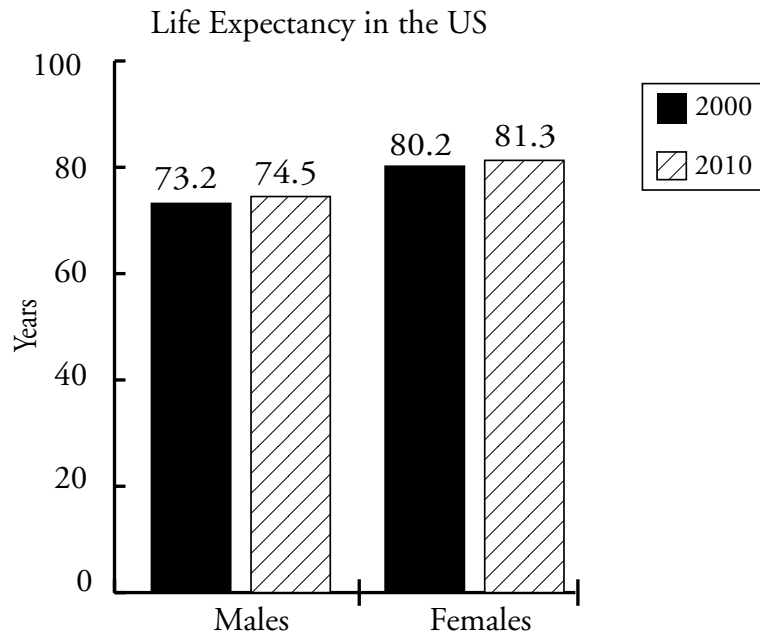
Significance Racial or ethnic groups have unique park visitation rates and may engage in different recreational activities. Individual parks attract minority visitation at different rates. Equal opportunity in hiring will alter the mix of NPS employees.

Surprise Scenarios Social norms and changes in US immigration policy may influence immigration and minority population growth.

Source Population Projections Program, Population Division. (1999). *United States Census Bureau*. <http://www.census.gov/population/projections/nation/summary/np-t2.txt>

Demography - Life Expectancy

In 2000, average life expectancy for a male in the US is 73.2 years; 80.2 years for a female. By 2010, life expectancy is projected to be 74.5 years for males and 81.3 years for females, an increase of 1.8% and 1.4% respectively.



Trend	Males	+1.8%
	Females	+1.4%

Significance Longer life expectancy will increase the size and relative proportion of America's older population. This may increase overall visitation to units of the National Park System. This growth may also influence demand for specialized activities, facilities, and visitor services within the National Park System.

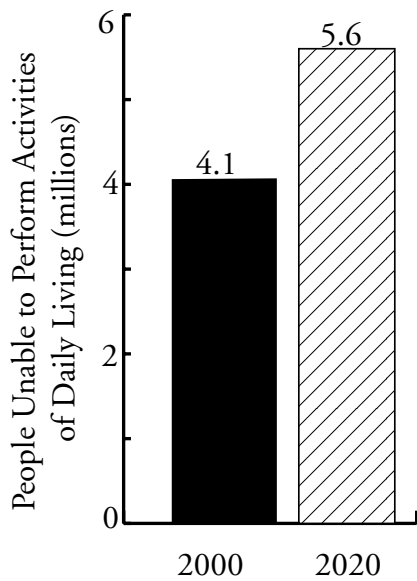
Surprise Scenarios Developments in health care and medical technology may extend average life expectancy. Healthier and more active lifestyles may also contribute to longer life expectancy.

Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.

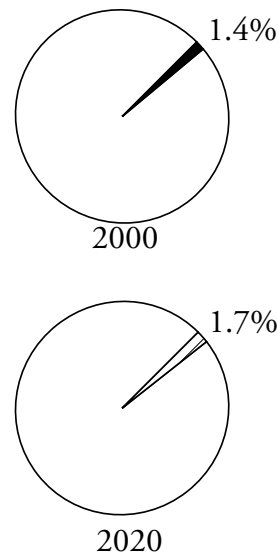
Demography - Disabled Population

Disabled persons have a physical or mental impairment that significantly restricts their ability to perform typical activities of daily living. In 2000, there are 4.1 million disabled Americans. The number of disabled Americans is projected to increase 36.6% to 5.6 million by 2020.

Number of Disabled Americans



% of Total US Population



Trend

Number of People with Disabilities	+1.5 million
Percent Change in US Population	+0.3%

Significance

As the population of disabled Americans increases, the number of disabled visitors to NPS units is also likely to increase. Disabled visitors may require special access to facilities and may participate in unique recreational activities. As more disabled Americans enter the NPS workforce, institutional infrastructure and attitudes may likely change.

Surprise Scenarios

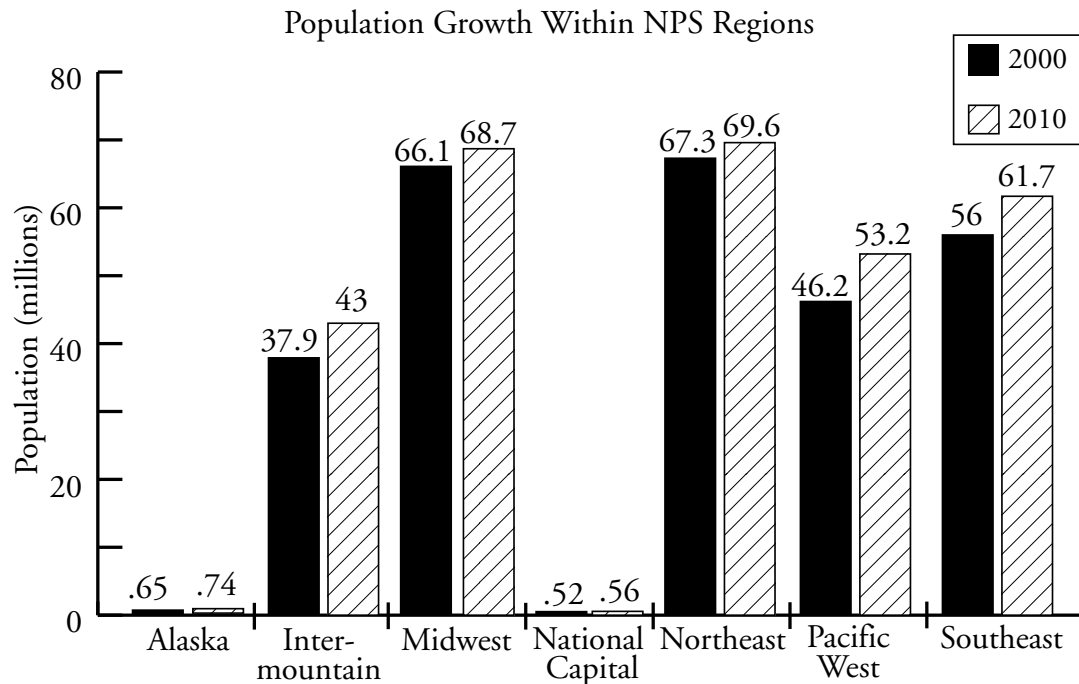
Research and development in medical technology may decrease the number of disabled visitors, and generally increase quality of life for disabled citizens.

Source

Beck, John C. & Stuck, Andrea. (1996). *Journal of the American Medical Association*, 276 (21), 1756.

Demography - Regional Population Growth

The seven NPS regions will experience varying population growth rates over the next decade. The population of the Pacific West Region is projected to have the greatest growth, increasing 15.2% by 2010. The Northeast Region is projected to experience the least growth, as its population increases 3.4% by 2010.



Trend	Alaska	+13.8%	Northeast	+3.4%
	Intermountain	+13.5%	Pacific West	+15.2%
	Midwest	+3.9%	Southeast	+10.2%
	National Capital	+7.7%		

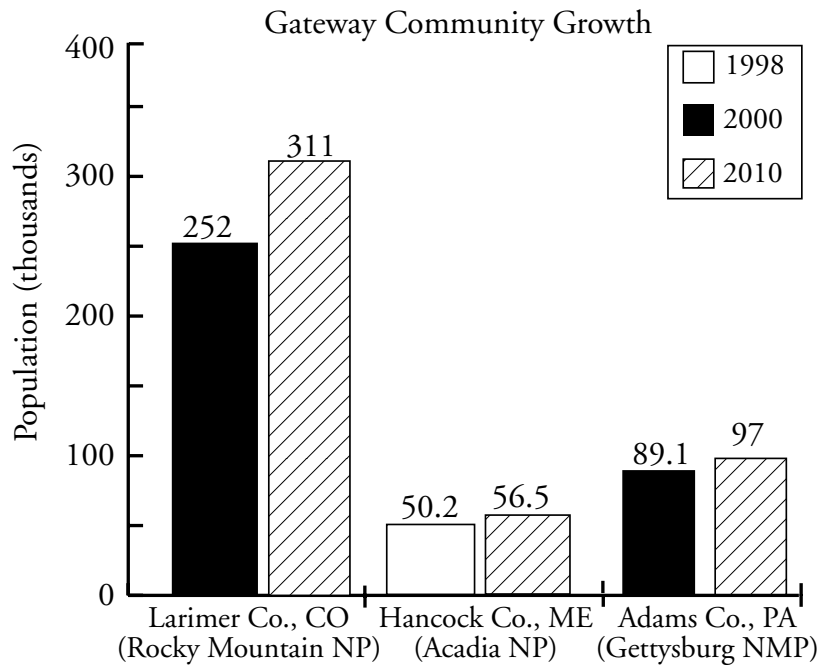
Significance Regional population growth can affect resource use within and adjacent to parks, increase demand for park access, and cause environmental pressures on large-scale ecosystems.

Surprise Scenarios Regional economic conditions can affect migration patterns. Regional populations may also be influenced by higher-than-projected migration of older Americans to more desirable retirement locations.

Source Total Population and Net Change for States. (2000, July). *United States Census Bureau*. <http://www.census.gov/population/www/projections/popproj.html>

Demography - Gateway Community Growth

Gateway communities adjacent to units of the National Park System provide services and facilities for park visitors. Examples illustrate that population growth within counties containing NPS units may be significantly higher than their respective state's population growth.



Trend	County Population Growth		State Population Growth	
	Larimer Co.	+23.4%	Colorado	+13.8%
	Hancock Co.	+12.5%	Maine	+7.8%
	Adams Co.	+8.9%	Pennsylvania	+1.4%

Significance Local population growth can influence resource use, demand for outdoor recreation, and the environmental quality of both parks and the regional ecosystems.

Surprise Scenarios Telecommuting may play an increasing role in the economic viability of living in gateway communities. As urban populations increase, more people may seek a higher quality of life and migrate to gateway communities.

Source *Estes Valley Plan*. Chapter 2. (2000, July). http://www.co.larimer.co.us/depts/planni/planning/estes_valley_plan/estes_valley_plan_toc.htm
Maine State Planning Office. (1999). <http://janus.state.me.us/spo/economic/economic.htm>
Pennsylvania State Data Center. (2000). http://pasdc.hbg.psu.edu/pasdc/Data_&_Information/data_by_type/population_demographics.html

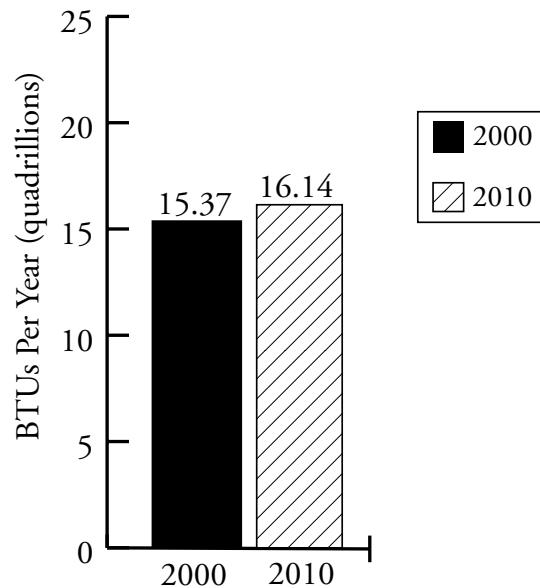
Chapter Two

Technology

Technology - Motor Vehicle Gasoline Consumption

In 2000, annual consumption of motor vehicle gasoline in the US was measured at 15.37 quadrillion British Thermal Units (BTUs). By 2010, the consumption will have increased a projected 5%, to 16.14 quadrillion BTUs.

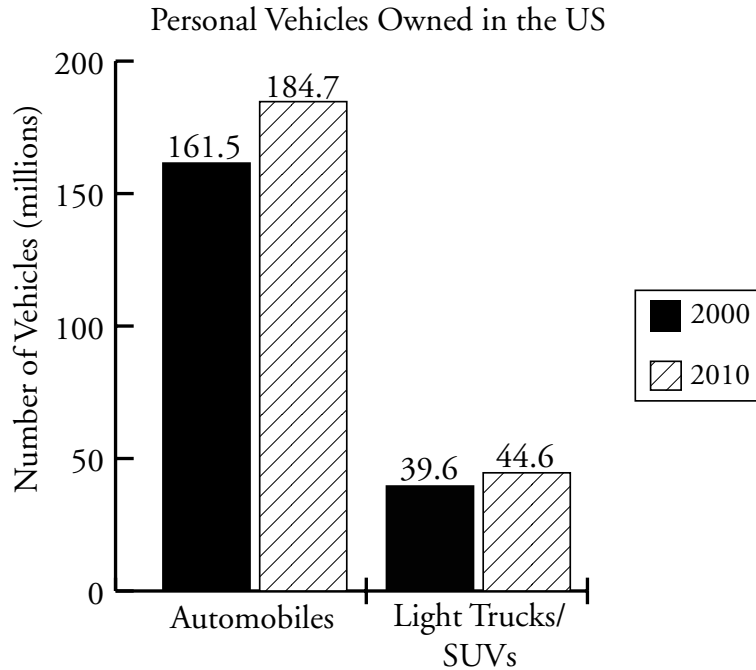
Annual Motor Vehicle Gasoline Consumption



Trend	Motor Vehicle Gasoline Consumption	+5.0%
Significance	Increasing oil prices may decrease automobile fuel consumption, and fuel consumption affects short-term visitation to the national parks. As the cost of travel influences recreational behavior, long distance travel may not be economically practical for certain user groups. Demand for local recreational opportunities that involve less travel may increase around the country. Use of urban area units of the National Park System may increase.	
Surprise Scenarios	Alternative automotive fuels may decrease our dependency on gasoline and diesel fuels. Increased engine efficiency can contribute to less fuel consumption and better gas mileage. Shortages in motor vehicle gasoline may be caused by limited supply or international political events.	
Source	Pollock, Sean R. (ed.). (1995). <i>Statistical Forecasts of the United States</i> . New York: Gale Research Inc.	

Technology - Personal Vehicle Ownership

The number of automobiles owned in the US continues to increase. In 2000, there are 161.5 million automobiles and 39.6 million light trucks/SUVs owned by the public. Over the next decade, these numbers will increase to 184.7 million and 44.6 million respectively, as automobile ownership increases 14.4% and light truck/SUV ownership increases 12.6% by 2010.



Trend	Number of Automobiles	+14.4%
	Number of Light Trucks/SUVs	+12.6%

Significance Increased personal vehicle ownership adds to the existing challenge to accommodate vehicles in units of the National Park System. Automobile ownership also contributes to sprawl, impacting gateway communities and parks near suburban areas.

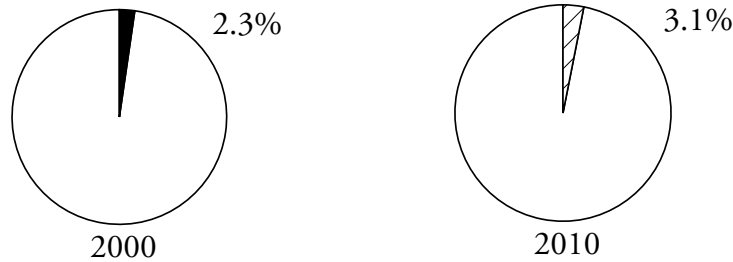
Surprise Scenarios New technologies, changes in disposable income, and consumer interest rates may alter affordability of personal vehicles.

Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.

Technology - Recreational Vehicle Use

Recreational vehicles (RVs) are increasingly common on America's highways and in NPS units. Currently, 9.3 million motorhomes, travel trailers, fifth-wheels, campers, folding camping trailers, and van conversions are on the road. The percentage of households in the US that owned an RV was 2.3% in 1999. Over the next ten years, the number of RVs and proportion of households with an RV should rise only moderately. By 2010, an increase of 0.8% in the number of RVs is projected, with RV ownership to include 3.1% of all households.

US Households That Own an RV

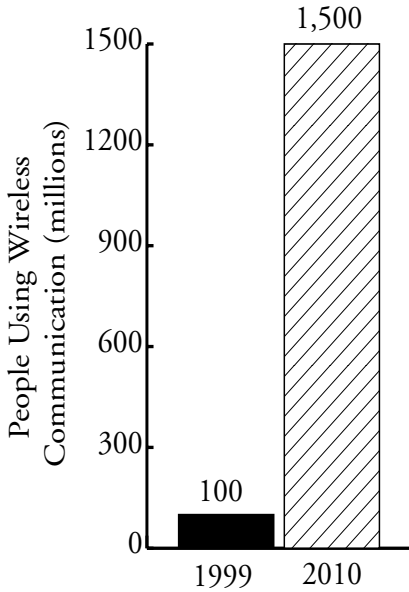


Trend	Percentage of US Households that Own an RV	+0.8%
Significance	Development of RV services such as campsites, parking, dump stations, water and electrical hookups, and accessible roads can impact park annual budgets and resources. Large, slower vehicles can add to traffic congestion within parks.	
Surprise Scenarios	Regulations limiting access of large personal vehicles may decrease RV usage. New technologies may lower RV costs and increase their fuel efficiency. Changes in demographics (aging population) may increase purchases of RVs.	
Source	University of Michigan Survey Research Center Study for the Recreational Vehicle Industry Association. (1998). <i>Recreational Vehicle Industry Association</i> . Ann Arbor, MI: University of Michigan, Ann Arbor.	

Technology - Global Wireless Communication Use

Wireless technology has changed the way people around the globe communicate. For 1999, worldwide use of wireless services was estimated at 100 million users. Advancements in technologies and adoption of wireless communication are projected to increase use 1400% to 1500 million individuals by the year 2010.

Global Wireless Communication Users



Trend Number of People Using Wireless Communication +1400%

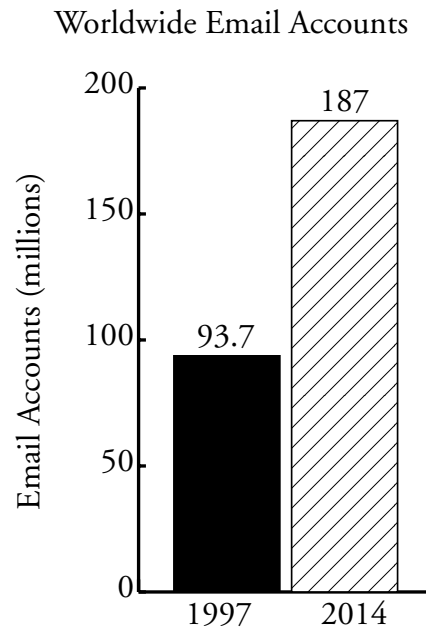
Significance Wireless technology can affect the daily operations of individual park units. Search and rescue communications, public accessibility to park information, and facilities management may be impacted by increased use of wireless systems. Increased dependency may also change the way visitors behave while recreating in the backcountry, as cellular phones become standard emergency equipment. Proposals to install wireless communication infrastructure in or adjacent to parks will increase.

Surprise Scenarios Occurrence of health problems concerning microwave radiation may lead to new regulations and change user behavior. New technology may make wireless communication more accessible.

Source The Regulatory Perspective. (2000). *Bermuda Telephone Company Limited*. <http://www.btc.bm>

Technology - Email Use

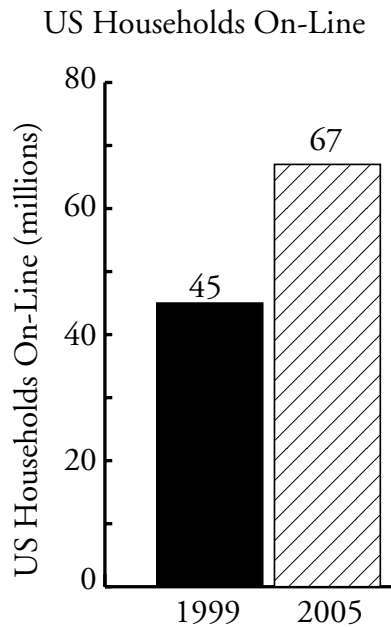
More people are relying on the use of computers and internet services to exchange information. The worldwide number of email accounts in 1997 was 93.7 million. A 99.6% increase is projected, as the number of accounts reaches 187 million by 2014.



Trend	Number of Email Accounts Worldwide	+99.6%
Significance	Public participation in NPS decision making could increase as more people provide input on management decisions via email. The electronic medium may facilitate meaningful communication regarding park visitor concerns and information inquiries, as well as communication within the agency.	
Surprise Scenarios	Increased frequency of internet use may be limited by insufficient support services. Increased concerns about personal privacy may decrease email traffic.	
Source	Kentworth, Ann C. (1998). What Trends Tell. <i>Association Management</i> , 50 (i13) 30.	

Technology - Households with Internet Access

The internet is increasingly accessible from home. More homes with access are using on-line capabilities to purchase goods, research products, and access public information. In 1999, 45 million households were on-line nationwide. By 2005, this is expected to increase 48.9% to 67 million households.



Trend Number of US Households On-Line +48.9%

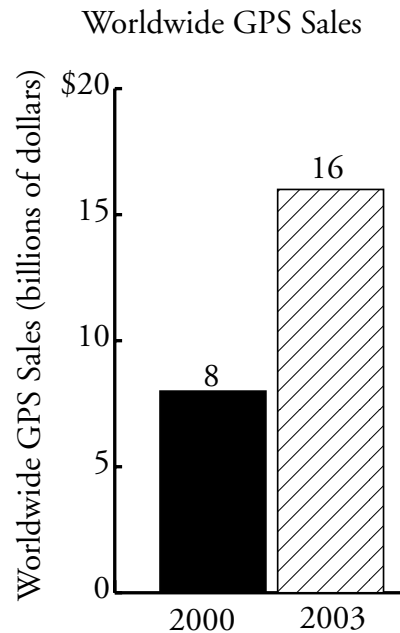
Significance The internet changes the manner in which the public can access information. Park regulations, facilities, visitor services information, and resource interpretation can be available to visitors before their actual arrival to the park. In addition, the internet can become a significant tool in public participation and collaborative decision-making.

Surprise Scenarios New web technology, taxation policy, and competitive computer pricing may slow or speed the expansion of households with internet access.

Source Mattis, Michael. (1999). Your Wireless Future. *Business 2.0*, 78-115.

Technology - Global Positioning Systems

Global positioning systems (GPS) are becoming standard equipment in automobiles, boats and aircraft, and as personal hand-held units. Annual sales around the globe were \$8 billion in 2000. Sales are estimated to reach \$16 billion by 2003. Worldwide sales of GPS units are projected to increase 100% over the next three years.



Trend Worldwide GPS sales +100%

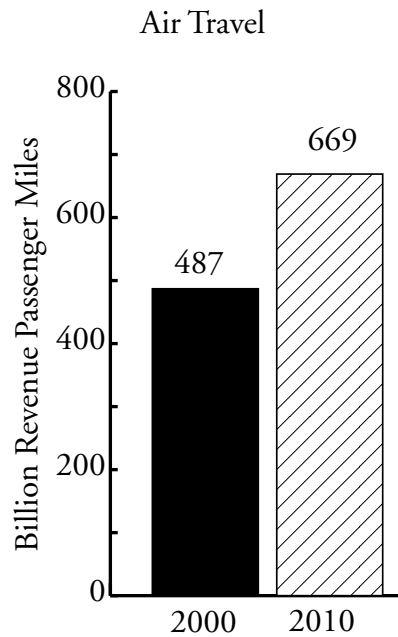
Significance GPS units can become essential tools for some forms of outdoor recreation. Dependence on GPS may lead to an increase in search and rescue activities as wilderness and backcountry users put trust in technology. GPS may also assist with park-related scientific research and resource management activities.

Surprise Scenarios Additional satellites may enable extended coverage and accuracy to GPS receivers. Development of smaller units may include GPS as a feature in the production of personal vehicles and outdoor equipment, further accelerating use of this technology.

Source Mattis, Michael. (1999). Your Wireless Future. *Business 2.0*, 78-115.

Technology - Air Travel

Air transportation has developed into an affordable and widely available means of travel. 487 billion revenue passenger miles were flown in 2000. An increase of 37.4% is expected over ten years, as 669 billion revenue passenger miles are projected to be flown in 2010.

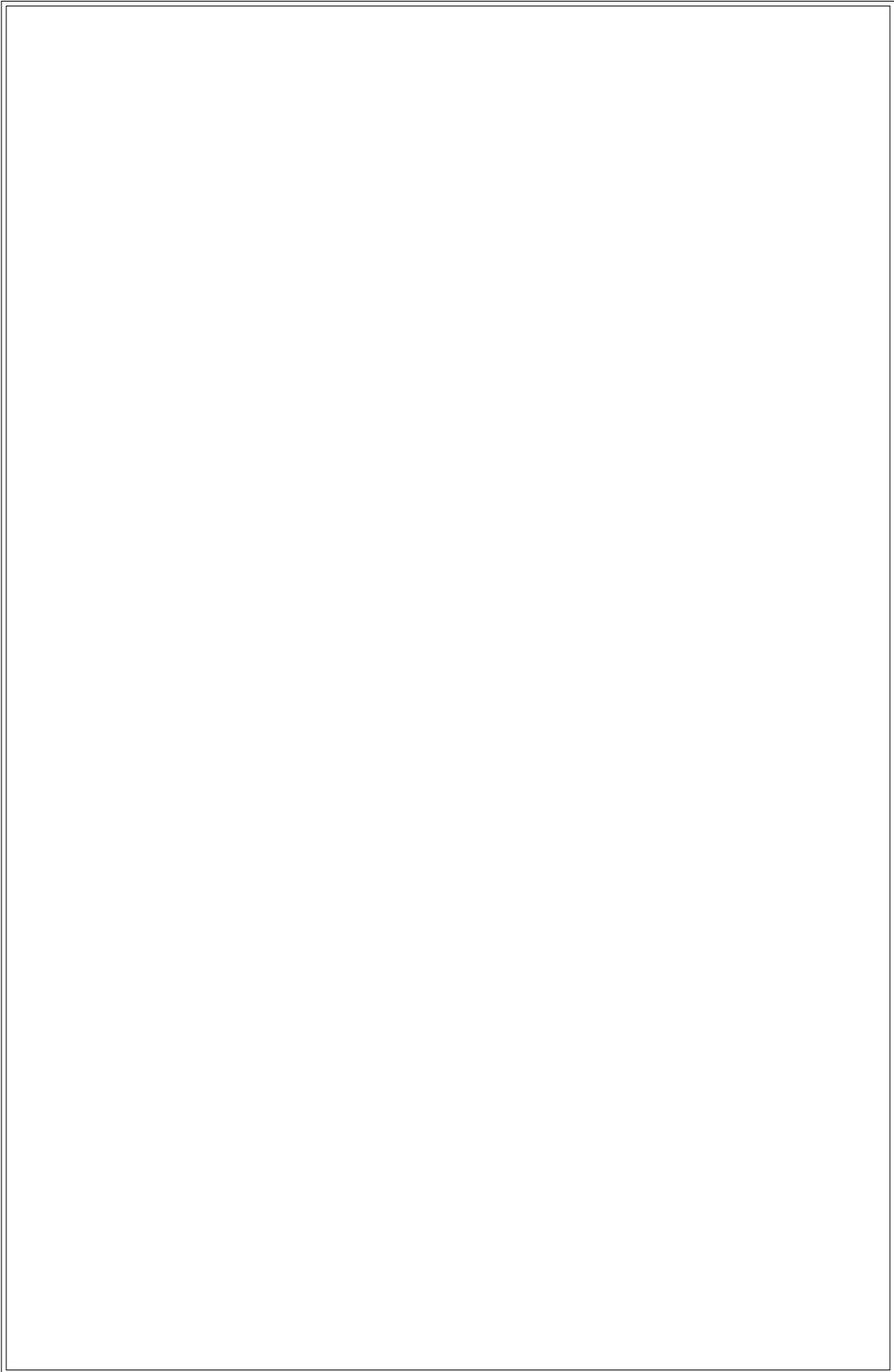


Trend Air Travel +37.4%

Significance Air travel allows for vacations to be taken far from home. Visits to NPS units near main air hubs (cities with major airports) will likely increase. Air travelers visiting parks may require alternative public transportation systems. Issues of overflights may arise as controversial concerns.

Surprise Scenarios Changes in economic conditions, the price of jet fuel, airline competition, and aviation policies can alter air travel patterns.

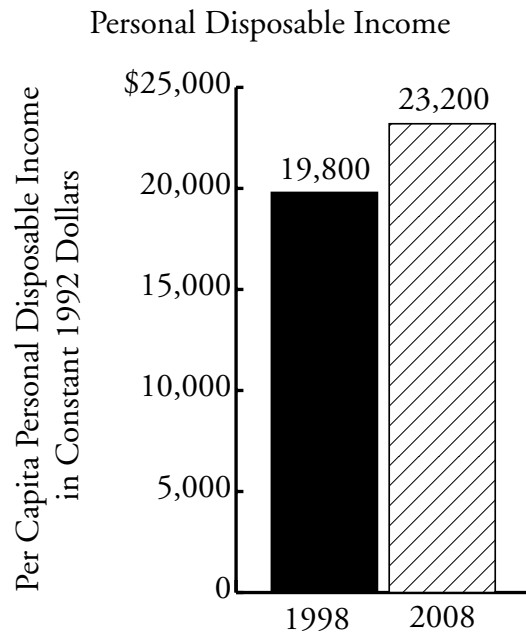
Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.



Chapter Three
Economics

Economics - Disposable Income

Disposable income is defined as total personal income minus federal, state, and local taxes. Average annual disposable income per capita was \$19,800 in 1998. By 2008, such income is projected to rise 17.2%; \$23,200 per capita.



Trend Per Capita Disposable Income +17.2%

Significance Increases in disposable income can influence visitation to the National Park System by making travel to parks more affordable. Willingness to pay for entrance fees, permits, and other services may increase as individuals retain more income for personal use.

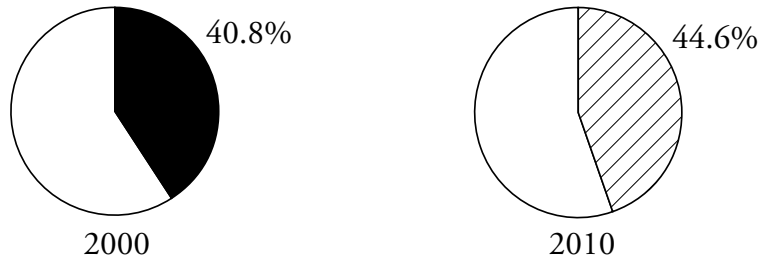
Surprise Scenarios Changes in national economy, surges in unemployment, revisions in tax policy, and inflation can alter disposable income projections.

Source Personal Income 1978, 1988, 1998, and Projected 2008. (1998). *Bureau of Labor Statistics*. <http://www.bls.gov/empmdio1.htm>

Economics - Pensions and Health Care Programs

As America's population ages, and advancements in medical technologies continue, people will require increasing amounts of pension and health care assistance. In 2000, the federal government is spending 40.8% of the budget on pensions and health care programs. By 2010, this will increase 3.8%, to account for 44.6% of the US budget.

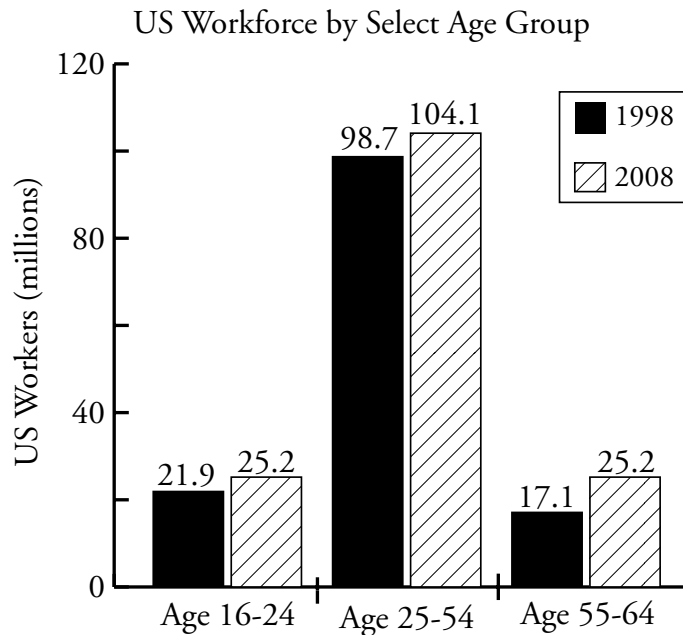
Percent of US Budget Spent on Pensions and Health Care Programs



Trend	Percent of US Budget Spent on Pensions and Health Care Programs +3.8%
Significance	Federal budget priorities will become redefined to meet the changing needs of America's rapidly growing senior population. As entitlements reflect a higher proportion of the federal budget, discretionary spending on other programs, such as the NPS, may become more difficult. Pensions and health care programs directly impact quality of life for seniors, an important NPS visitor group.
Surprise Scenarios	Changes in social security and medicare policies could significantly change the proportion of the federal budget spent on these entitlements. Unexpected advances in medical technologies could increase life span and the need for extended federal entitlements.
Source	Pollock, Sean R. (ed.). (1995). <i>Statistical Forecasts of the United States</i> . New York: Gale Research Inc.

Economics - US Workforce

America's workforce is projected to grow during the next decade. By 2008, the number of workers in the 16-24, 25-54, and 55-64 age groups, will increase 15.1%, 5.5%, and 47.4% respectively.



Trend	Age 16-24	+15.1%
	Age 25-54	+5.5%
	Age 55-64	+47.4%

Significance The relative size of a workforce can be an indicator of economic growth and structural changes in the economy. Increases within specific age categories may reflect changes in their relative spending power, including spending for leisure, recreation, and visiting parks.

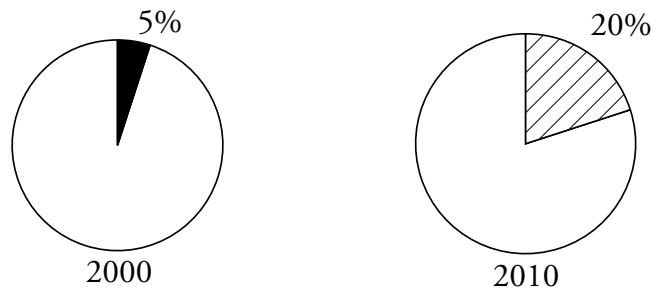
Surprise Scenarios Changes in workforce participation can affect the composition of the job market. Fluctuations in the economy may have impact on employment opportunities. Developments in specific industrial sectors could force certain job skills to become obsolete, thus reducing the need for workers.

Source 1998-2008 Employment Projections. (1999). *Bureau of Labor Statistics*. <http://stats.bls.gov/emphome.htm>

Economics - Telecommuting

A growing percentage of the US workforce is projected to work from home. In 2000, 5% of the US workforce work at home. By 2010, 20% of the US workforce is projected to work at home, a 15% increase.

Percent of the US Workforce Working at Home



Trend Percent of the US Workforce Working at Home +15%

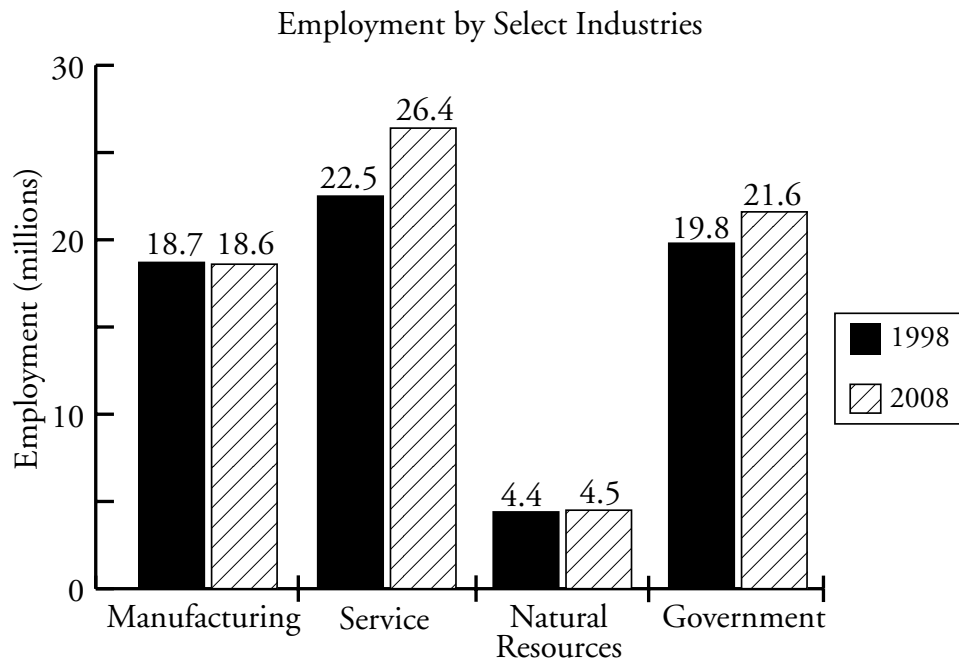
Significance The ability to work at home may allow more people to move closer to parks. Freedom in work schedules may also allow more leisure time for recreational activities.

Surprise Scenarios Changes in remote communication technology, real estate prices, urban quality of life, and commuting costs will influence telecommuting rates.

Source Whitenack, Amiee. (2000). *Experience*, 54-58.

Economics - Employment (Select Industries)

During the coming decade, employment in service and government will significantly increase—a 17.3% increase for service and 9.1% increase for government. Employment in manufacturing and natural resources will remain stable.



Trend	Manufacturing	-0.5%
	Service	+17.3%
	Natural Resources	+2.3%
	Government	+9.1%

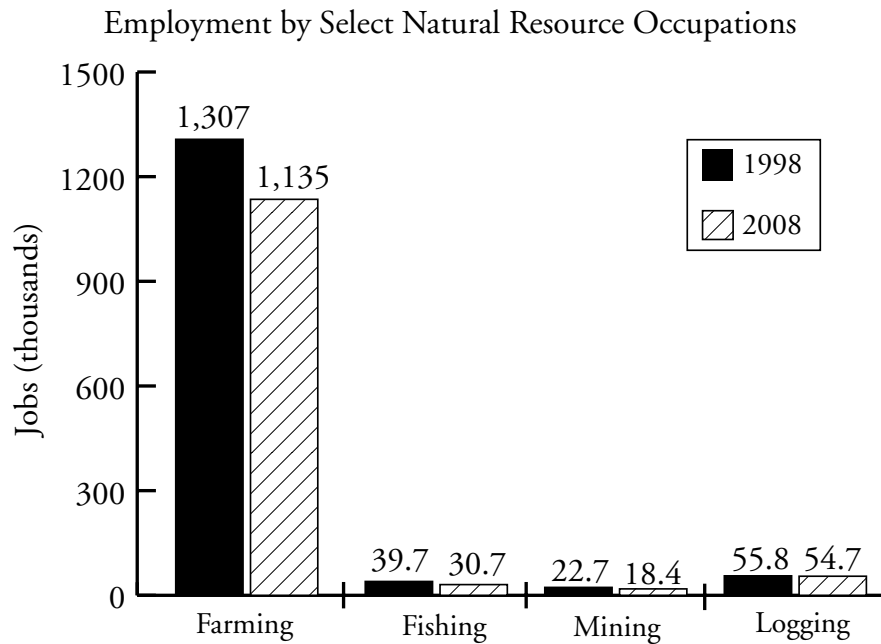
Significance Increases in service and government employment reflect structural changes in the US economy. Skilled workers will be attracted to these growth areas, competing with natural resource-related employment. The NPS may be impacted by both trends, as natural resource-related jobs remain relatively constant.

Surprise Scenarios New technologies may alter the service economy and speed the decline of manufacturing; government budgets and policies can alter government staffing levels.

Source 1998-2008 Employment Projections. (1999). *Bureau of Labor Statistics*. <http://stats.bls.gov/emphome.htm>

Economics - Natural Resource-Related Employment

While overall, natural resource-related employment is expected to remain stable, select resource occupations will experience significant change. Farming, fishing, and mining will decline significantly; logging will decline modestly.



Trend	Farming	-13.2%
	Fishing	-22.7%
	Mining	-18.9%
	Logging	-2.0%

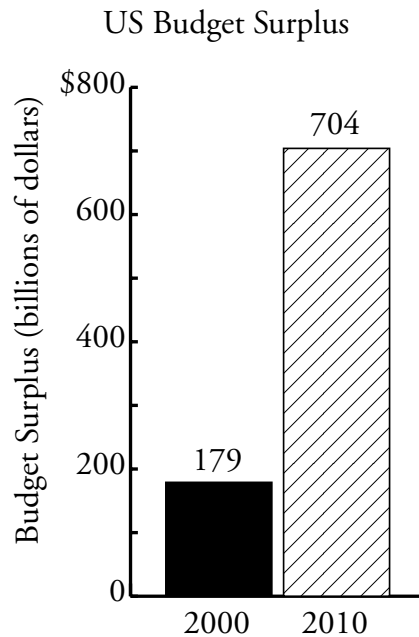
Significance Decline in these traditional industries will exacerbate environmental controversies in and around parks, as industries strive to maintain employment levels. Decline in employment may signal an increase in technology replacing labor, as production levels (and pressures on the parks) remain constant or increase.

Surprise Scenarios New technologies, additional environmental regulations, deteriorating resource conditions/supplies, and global trade patterns can alter labor demands in these fields.

Source Occupation Search. (2000, July). *Bureau of Labor Statistics*. <http://stats.bls.gov/asp/oep/nioem/empiohm.asp>

Economics - Federal Budget

The prosperity of the 1990s, combined with fiscal policy, has led to a federal budget surplus. In 2000, the budget surplus is approximately \$179 billion. By 2010, the surplus is projected to increase 293.3% to \$704 billion.



Trend Budget Surplus +293.3%

Significance An increased budget surplus may provide more funding opportunities for the NPS and other resource management agencies. Increased spending on environmental concerns may create a window for the adoption of a more ecosystem-based approach to environmental management.

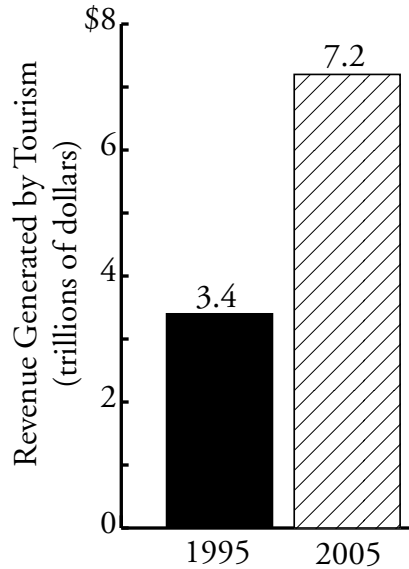
Surprise Scenarios Domestic and international stock market volatility, changes in economic policies, new defense needs, and free trade agreements could affect the projected budget surplus.

Source Current Budget Projections. (1999). *Congressional Budget Office*. <http://www.cbo.gov>

Economics - Global Tourism

Worldwide, tourism has become a significant industry. Annual global revenue in 1995 was estimated to be \$3.4 trillion, and projected to increase over 100% by 2005. In addition, tourism arrivals and jobs are expected to have large increases (see following page).

Worldwide Annual Revenue Generated by Tourism



Trend	Global Revenue Generated by Tourism	+111.8%
	Worldwide Jobs Created by Tourism	+50.0%
	Worldwide International Tourism Arrivals	+42.5%

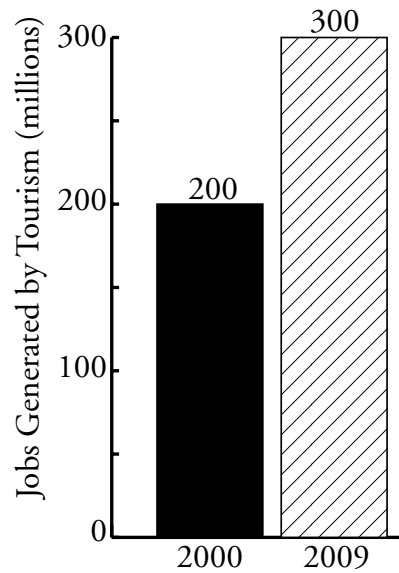
Significance Increased global tourism will lead to larger numbers of foreign visitors to US parks, and increased pressure on visitor services in the parks of other countries.

Surprise Scenarios Economic and political conditions of nations directly impact global tourism. War, terrorism, and economic instability can alter forecasts.

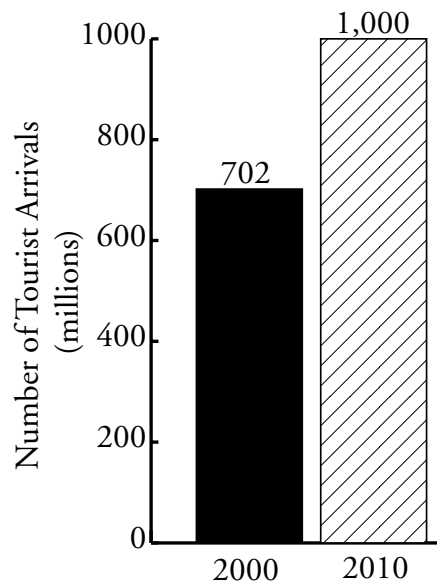
Source World Travel and Tourism Council. (1995). *Viewpoint*, 1 (2).

Economics - Global Tourism (cont.)

Worldwide Jobs Created by Tourism



Worldwide International Tourism Arrivals



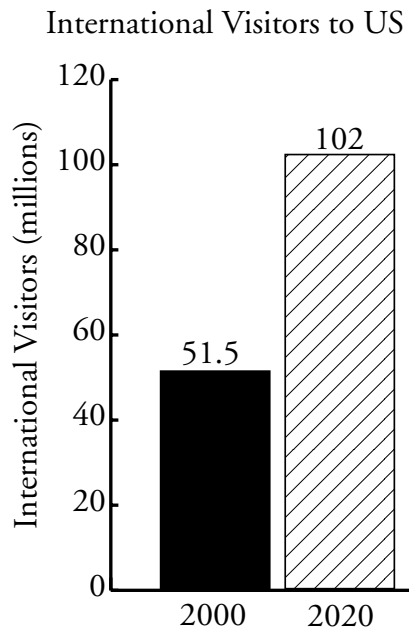
Source

Fennel, D. A. (1999). Ecotourism: An Introduction. *World Tourism Organization*. Routledge, NY.

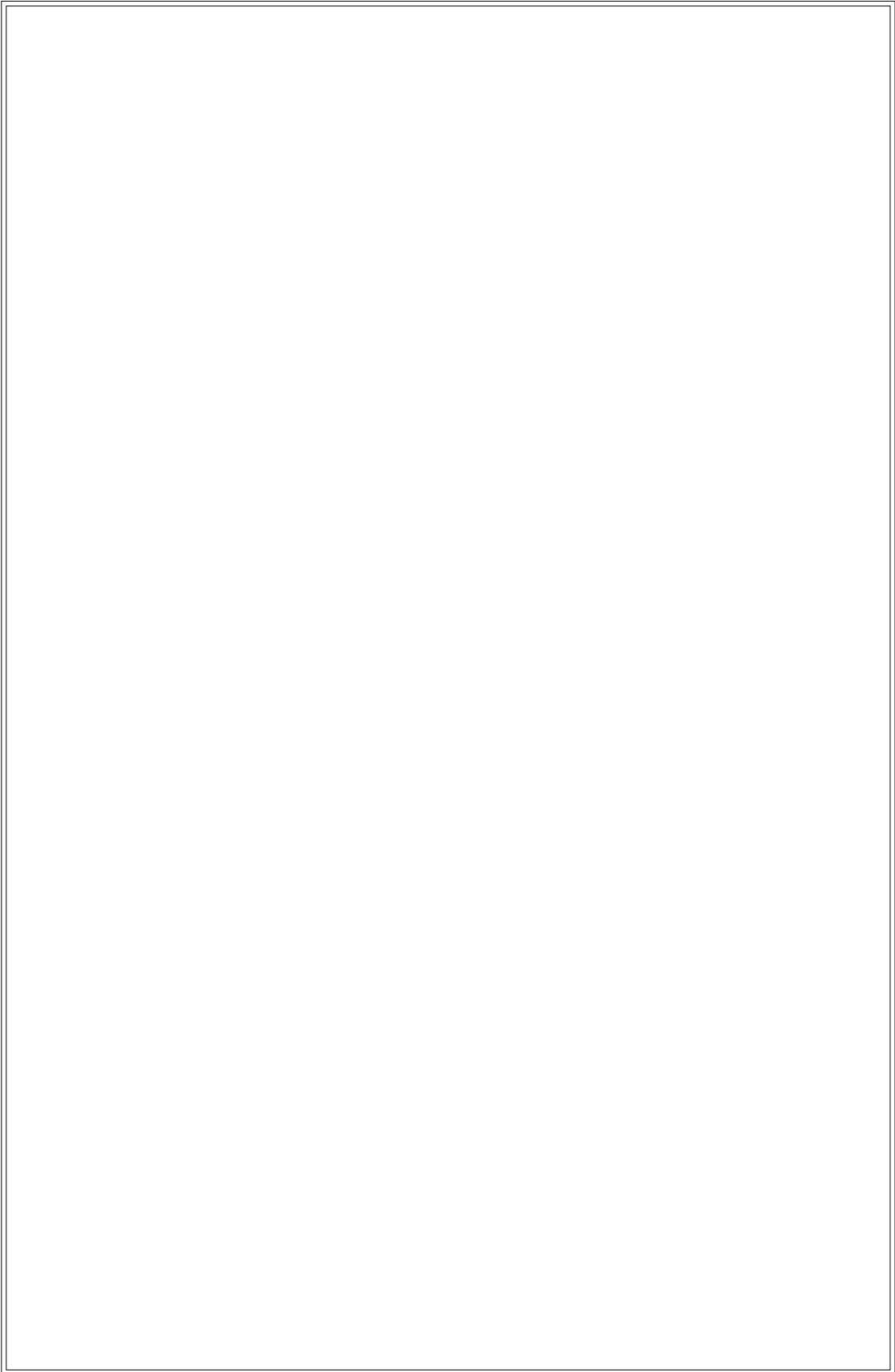
Wetzstein, Cheryl. (2000). More Play, Less Work Foreseen for Americans. *Insight on the News*, 16 (i6) 32.

Economics - International Visitors to the US

The United States attracts a significant number of world travelers. International visitors to the US are increasing rapidly. 51.5 million international tourists visited the US in 2000. A 98.1% increase is expected, as projections estimate 102 million international visitors in 2020.



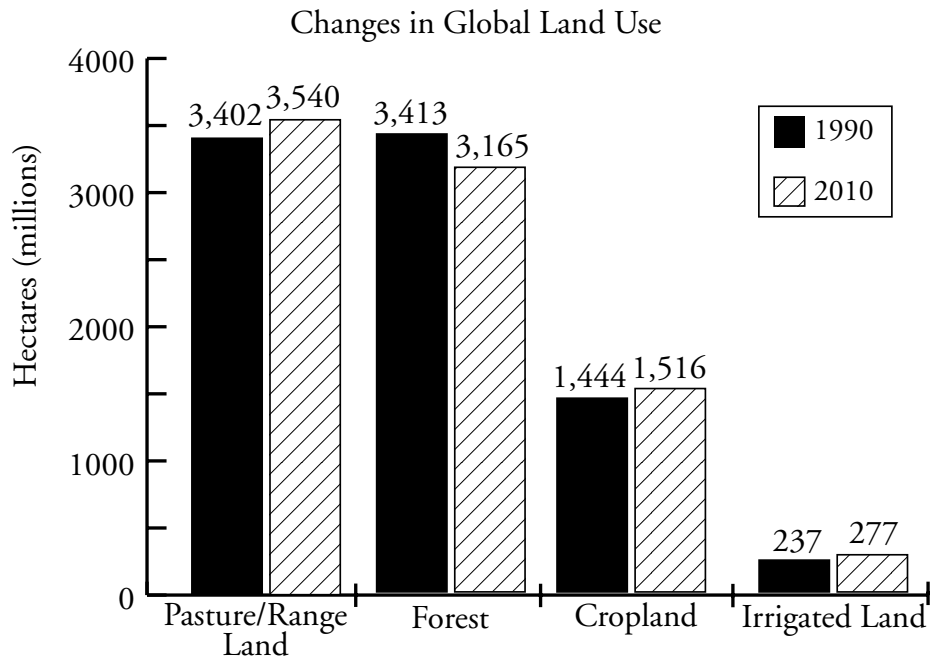
Trend	International Visitors to US	+98.1%
Significance	Foreign visitation accounts for an increasing portion of people visiting the National Park System. Specific parks have a high percentage of international visitors. Increased international tourism to the US will accelerate both trends. Accommodating international visitors will require changes in interpretive media and information services.	
Surprise Scenarios	Additional services provided for foreign travelers could change international visitation. Foreign economic stability may permit increased visitation to the US. International visitation can be affected by the foreign exchange rate, airline prices, special events (such as the Olympic Games), global and regional politics, and the general condition of the global economy.	
Source	Molitor, Graham T. (2000). Dawn of the Leisure Era. <i>Association Management</i> , 52 (i2) 85. Commerce News. (2000, May). <i>Department of Commerce</i> . http://www.ita.doc.gov/media/travel516.htm	



Chapter Four
Environment

Environment - Global Land Use

Rapid population growth and the associated resource demands are altering global land use practices. Between 1990 and 2010, global cropland, irrigated land, and pasture/rangeland are projected to increase 5.0%, 16.9%, and 4.1% respectively. Forest cover is projected to decline 7.3% in the same time period.



Trend	Pasture/Range Land	+4.1%
	Forest	-7.3%
	Cropland	+5.0%
	Irrigated Land	+16.9%

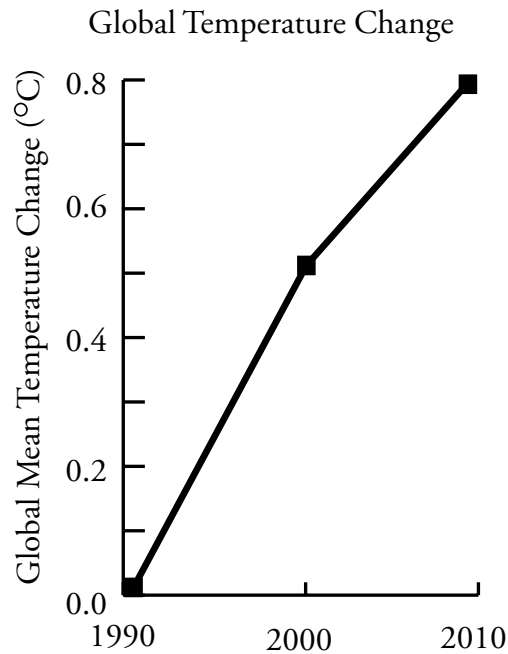
Significance The status of designated wilderness and other protected areas may be compromised to meet other land use needs. The expansion of certain land use practices throughout the world can affect species habitat within parks and increase threats to park ecosystems.

Surprise Scenarios Advances in technology may decrease the detrimental effect caused by some current land use practices. Improved production per hectare may decrease the demand for more land area. Changes in land ethics may influence decisions made about land resources.

Source Postel, S. (1994). *Carrying Capacity: Earth's Bottom Line. State of the World.* W.W. Norton & Company, Inc. New York, NY.

Environment - Global Temperature Change

The buildup of greenhouse gasses – primarily carbon dioxide – has caused a gradual increase in the global temperature. Between 1990 and 2000, a global mean temperature change of 0.5 degrees Celsius occurred. During the period of 2000-2010, the global mean temperature is projected to increase an additional 0.3 degrees Celsius, as the total mean temperature change reaches 0.8 degrees Celsius.



Trend Global Mean Temperature Change +0.3 degrees Celsius

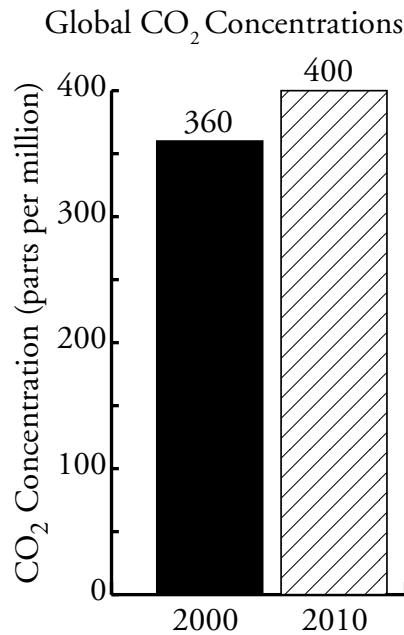
Significance Further increases in global temperature can alter rainfall patterns, vegetation types, habitat suitability, species' home ranges, and the spread of invasive, non-native species within and adjacent to parks.

Surprise Scenarios Global climatic patterns are highly variable. Innovations in technology and significant changes in international environmental policies may decrease greenhouse gas production and reduce global temperature increases to smaller amounts.

Source *President's Council on Sustainable Development*. Chapter 7. (2000, July). http://www.whitehouse.gov/PCSD/Publications/TF_Reports/amer-chp7.html

Environment - Global CO₂ Concentrations

High CO₂ concentrations from combustion of fossil fuels is thought to be a primary cause of global warming. In 2000, global concentration of carbon dioxide was 360 parts per million. An increase of 11.1% is projected to occur as concentrations reach 400 parts per million in 2010.



Trend Global CO₂ Concentrations +11.1%

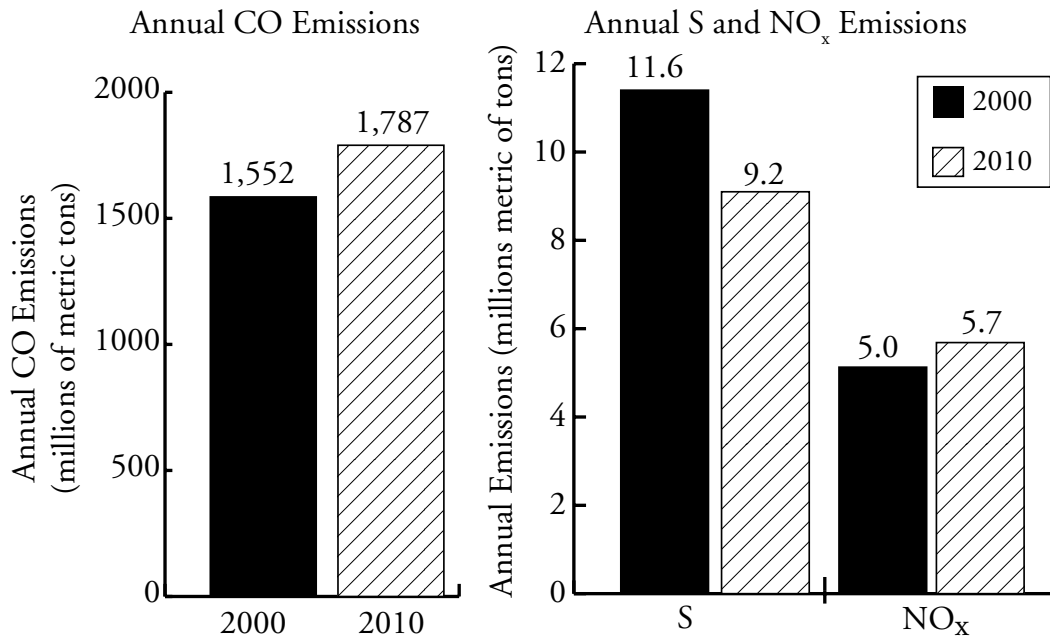
Significance Increasing CO₂ concentrations may have an influence on global temperature and precipitation. Changes in rainfall can significantly alter large-scale ecosystems, including parks, and modify wildlife species habitats, ranges, migration patterns, and population levels.

Surprise Scenarios Innovations in technology and significant changes in international environmental policies may decrease CO₂ production.

Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.

Environment - Atmospheric Pollutants

Human activities, such as industry and transportation, release carbon monoxide, sulfur, and nitrogen oxides into the atmosphere. Carbon monoxide (CO) and nitrogen oxide (NO_x) emissions in the US are projected to increase 15.1% and 14% respectively, between 2000 and 2010. Sulfur (S) emissions are projected to decrease 20.7% during the same time period.

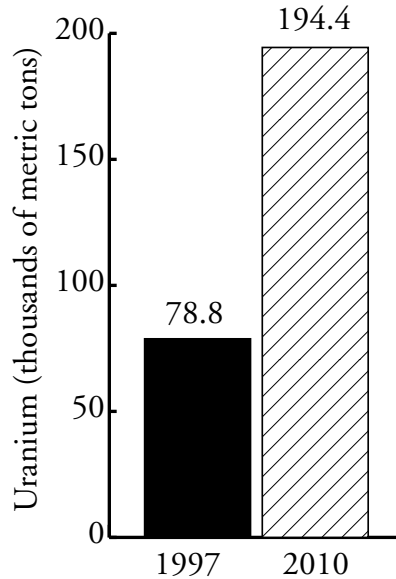


Trend	Annual CO Emissions +15.1% Annual S Emissions -20.7% Annual NO _x Emissions +14.0%
Significance	Increased pollutants can affect the air quality and the viewsheds of parks. This, in turn, can affect park visitation rates and recreational activities. Atmospheric pollution can directly damage historic structures and monuments.
Surprise Scenarios	Significant changes in industrial techniques, pollution abatement technologies, economic conditions, and environmental policies can influence the amount of pollutants released into the atmosphere.
Source	Annual Energy Outlook 1997. (1997). <i>US Energy Information Administration</i> . Washington, DC.

Environment - Spent Nuclear Fuel

Nuclear fuel provides a portion of US energy resources; spent nuclear fuel as a waste by-product is increasing. In 1997 there were 78,800 metric tons of spent uranium. By 2010, this is projected to increase 146.7%, to 194,400 metric tons.

Cumulative Spent Nuclear Fuel, Uranium



Trend Spent Nuclear Fuel +146.7%

Significance Disposal of spent fuel materials is complex and controversial. Few areas may be determined suitable and publicly acceptable for long term containment of nuclear waste. Alternatives proposed for storage may include sites within or near parks.

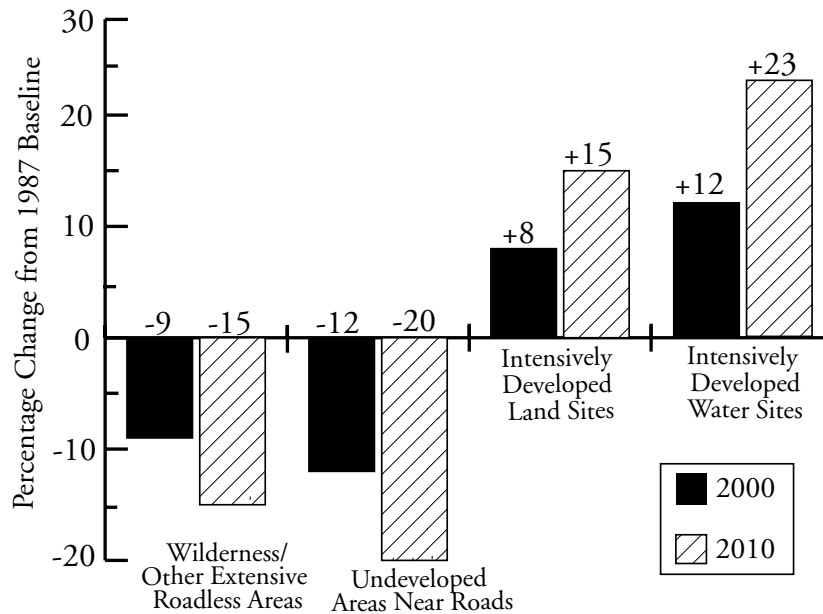
Surprise Scenarios New technologies in waste disposal may lessen demand for highly secure disposal sites. Nuclear accidents may alter public opinion about siting decisions.

Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.

Environment - Wilderness and Undeveloped Land/ Intensively Developed Areas

Over the next decade, there will be dramatic changes in the American landscape. The amount of acreage in wilderness/extensive roadless areas and undeveloped areas near roads will decrease, while the amount of acreage in intensively developed areas will increase.

Changes in Wilderness and Undeveloped Land/Intensively Developed Areas



Trend	Wilderness and Other Extensive Roadless Areas	-6%
	Undeveloped Areas Near Roads	-8%
	Intensively Developed Land Sites	+7%
	Intensively Developed Water Sites	+11%

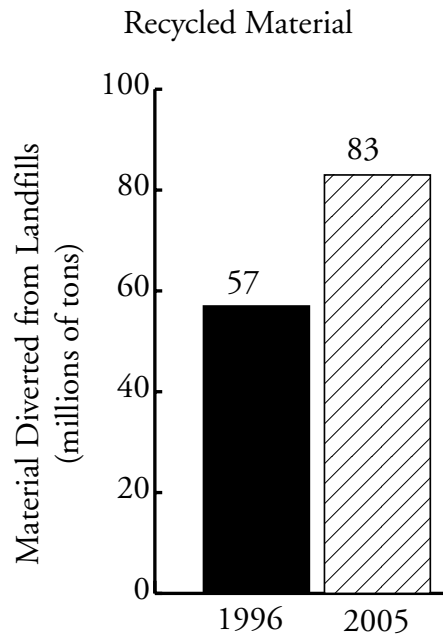
Significance A decrease in wilderness and undeveloped land is likely to increase pressures on existing parks with similar values. Intense development on land adjacent to parks will pose significant management challenges to the parks.

Surprise Scenarios Technological advances in fields such as resource extraction and bioprospecting may alter our need to exploit resources in remote areas. Significant environmental regulations may restrict development.

Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.

Environment - Recycling

Recycling can help reduce virgin material consumption and environmental pollution. In 1996, recycling diverted 57 million tons of material away from landfills and incinerators. A 45.6% increase in recycled material is projected as 83 million tons of material will be diverted from landfills in 2005.



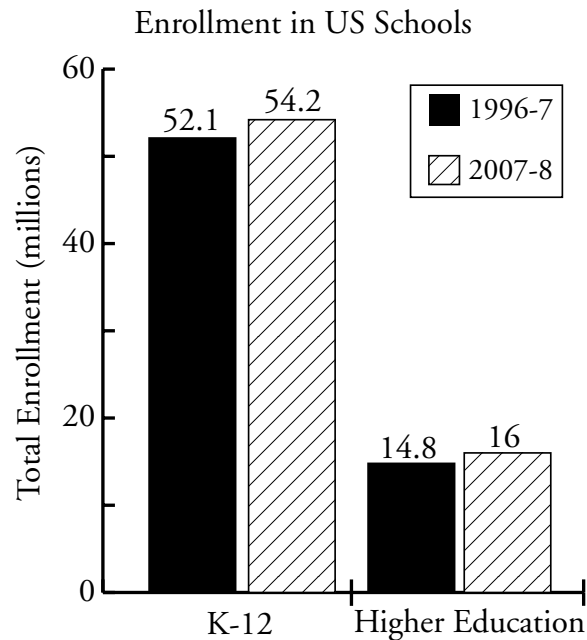
Trend	Material Diverted from Landfills	+45.6%
Significance	Public participation in recycling efforts may result in less material consumption and littering, and more demand for recycling services. Parks will be expected to have recycling facilities available and convenient. Demand for recycled products at parks will likely increase.	
Surprise Scenarios	Development in recycling technologies may further diminish the need for landfills. Future strategies, such as “garbage mining” may be encouraged as buried materials are sought out for their recycled value. Development of economically viable recycling technologies and changes in societal values may influence recycling participation.	
Source	Whitehouse Task Force on Recycling. (1998). <i>Recycling for the Future</i> . Washington, DC.	

Chapter Five

Culture

Culture - School Enrollment

The number of students enrolled in US schools is projected to increase. Between the 1996-1997 and 2007-2008 school years, enrollment in kindergarten through the twelfth grade (K-12) and in higher education programs will increase 4% and 8.1% respectively.



Trend	Enrollment in K-12	+4.0%
	Enrollment in Institutions of Higher Education	+8.1%

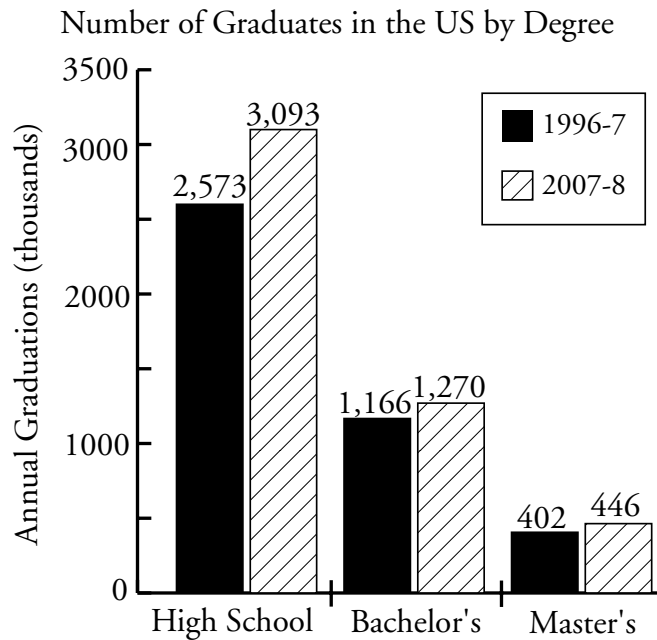
Significance Enrollment in learning institutions may influence the use of national park sites, as demand for services by educational groups changes. The increase in enrollment in higher education programs may provide the NPS with a larger pool from which to select interns and seasonal employees. Enrollment in learning institutions may influence the level of public participation in resource decision-making, recreational behavior, and public opinion on environmental issues.

Surprise Scenarios Significant changes in micro and macro economic factors, tuition costs, and educational policies could influence higher education enrollment. Unexpected demographic changes (such as increased birthrates) could alter projections of K-12 enrollment.

Source Projections of Education Statistics to 2008. (1998). *National Center for Educational Statistics*. <http://nces.ed.gov/edstats>

Culture - Educational Level

The number of Americans attaining educational degrees is projected to increase. Between the 1996-1997 and the 2007-2008 school years, the annual number of high school degrees, bachelor's degrees, and master's degrees is projected to increase 20.2%, 8.9%, and 10.9% respectively.



Trend	High School	+20.2%
	Bachelor's	+8.9%
	Master's	+10.9%

Significance Education level is an important consideration in such park management activities as marketing, public participation processes, and the design of interpretive information and outreach programs. Changes in average education level of the adult population can influence the pool of potential NPS employees.

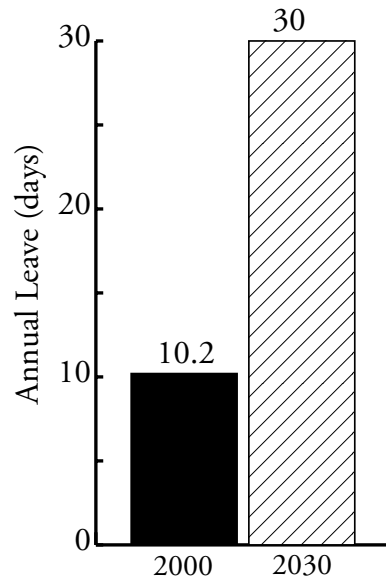
Surprise Scenarios Changes in job skill requirements may alter demand for advanced training and further education. Job opportunities may influence personal decisions to pursue additional degrees. Changes in how students learn can impact their readiness to enroll in advanced programs. Tax and education policies may alter the affordability of higher education.

Source Projections of Education Statistics to 2008. (1998). *National Center for Educational Statistics*. <http://nces.ed.gov/edstats>

Culture - Annual Leave Days

Many employers are increasing the number of annual leave days they provide workers for personal absence. In 2000, the average number of days of annual leave taken by US workers is estimated to be 10.2 days. By 2030, workers are expected to take an average of 30 days of annual leave, accounting for a 194.1% increase.

Average Number of Annual Leave Days Taken by US Workers



Trend Number of Annual Leave Days +194.1%

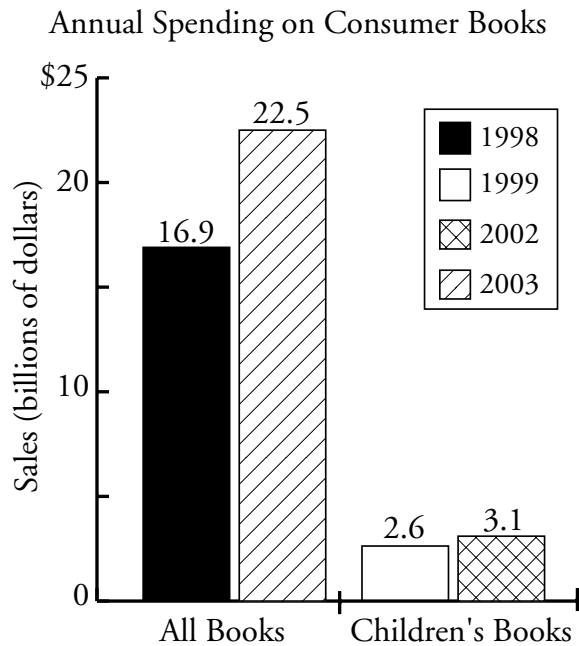
Significance As workers are granted more personal leave time by employers, visitation to national park sites may increase. Changes in the duration and frequency of visits to parks can affect resources, services, and facilities. Leave taken by NPS employees will impact operations.

Surprise Scenarios Changes in the economy (e.g., Gross Domestic Product, Consumer Price Index, inflation, unemployment), worker productivity, and societal values could influence the number of annual leave days taken by US workers.

Source Kentworth, Ann C. (1998). What Trends Tell. *Association Management*, 50 (13) 30.

Culture - Reading

Annual spending on consumer books is projected to increase significantly. The \$2.6 billion spent on children's books in 1999 will increase 19.2% to \$3.1 billion in 2002. The \$16.9 billion spent on all consumer books in 1998 will increase 33.1% to \$22.5 billion in 2003.

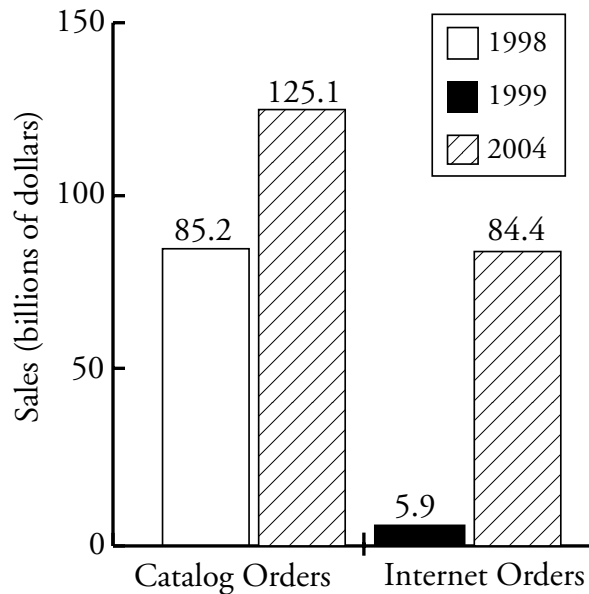


Trend	Spending on all Consumer Books +33.1% Sales of Children's Books +19.2%
Significance	Book sales can be an indication of how Americans are educating themselves. Increased book reading can broaden public knowledge in many areas of interest. Increased book purchasing may influence park management decisions regarding information delivery and support of cooperating associations (bookstores).
Surprise Scenarios	Changes in economic conditions and perceptions toward e-books could influence consumer spending patterns on traditional books.
Source	Milliot, Jim. (1998). <i>Report Sees Moderate Growth for Consumer Books</i> . http://www.publishersweekly.com/articles/19991101_82423.asp Milliot, Jim. (1999). <i>Good Times Returning for Children's Books?</i> http://www.publishersweekly.com/articles/1990222_70840.asp

Culture - Home Shopping

Home shopping using both catalogs and the internet is projected to increase. Catalog orders in 1998 generated \$85.2 billion in sales. An increase of 46.8% is expected as \$125.1 billion in sales is projected in 2004. In 1999, orders over the internet reached \$5.9 billion in sales. Growth is expected to increase 1330.5% as 2004 projections put internet sales at \$84.4 billion.

Annual Sales Made by Catalog and the Internet



Trend	Catalog Sales	+46.8%
	Internet Sales	+1330.5%

Significance The convenience of home shopping has transformed the way Americans conduct business. Increased use of home shopping may influence ways in which the NPS and its partners provide information, manage reservations, and generate sales.

Surprise Scenarios Changes in disposable personal income, Gross Domestic Product, internet security, and product delivery could influence home shopping patterns.

Source The Direct Marketing Association. (1999). *American Demographics*.

Culture - Outdoor Recreation

To illustrate how participating in outdoor recreation will change for selected activities, this indicator uses projections based on a percentage of 1987 demand for recreation trips away from home. Between 1995 and 2008, increases in demand will vary from 30% for cross-country skiing, backpacking, and dayhiking, to 5% for stream or lake swimming.

Recreation Trips Away from Home (as a percentage of 1987 demand)

Activity	Current Condition (1995)	Trend	Future Projection (2008)
Cross-country skiing	147	+30%	177
Backpacking	134	+30%	164
Day hiking	131	+30%	161
Visiting prehistoric sites	133	+27%	160
Bicycling	125	+23%	148
Visiting historic sites	122	+21%	143
Photography	123	+20%	143
Visiting museums	118	+18%	136
Sight seeing	118	+18%	136
Developed camping	120	+17%	137
Wildlife observation	116	+15%	131
Walking for pleasure	116	+15%	131
Primitive camping	114	+13%	127
Canoeing/kayaking	113	+13%	126
Driving for pleasure	115	+13%	128
Picnicking	108	+9%	117
Stream/lake swimming	105	+5%	110

Significance Many of these activities are available in units of the National Park System. Recreational activities have varying impact on natural resources and require unique park facilities, services, interpretive media, and regulations. The increased demand for activities associated with backcountry and wilderness areas will put pressure on these areas in many ways.

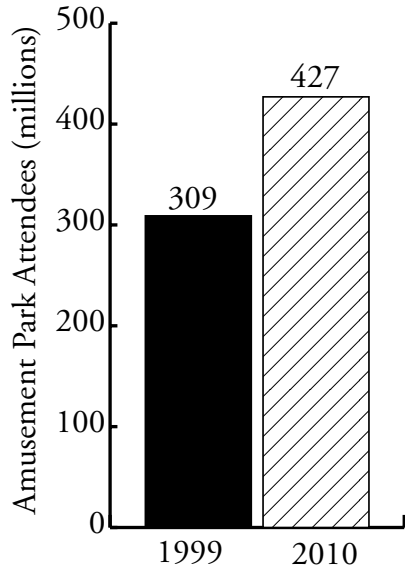
Surprise Scenarios Changes in rules and regulations protecting natural resources may influence use patterns. Developments in sports technology may allow a wider range of users to take advantage of existing recreational opportunities. Perceived crowding of parks may influence outdoor recreational behavior. Economic instability may alter projected recreation demand.

Source Pollock, Sean R. (ed.). (1995). *Statistical Forecasts of the United States*. New York: Gale Research Inc.

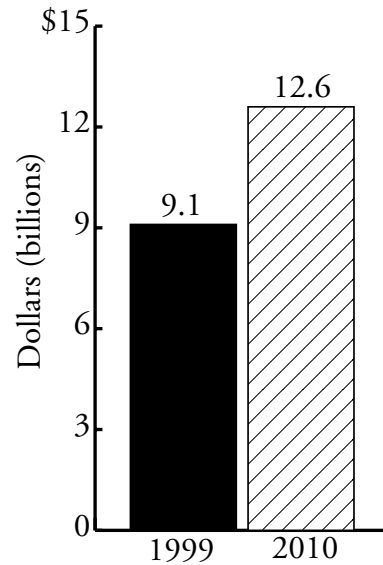
Culture - Global Amusement and Theme Park Visitation

Amusement and theme parks are projected to grow in popularity in the next decade. In 1999, 309 million people visited amusement and theme parks, generating \$9.1 billion in attendance revenue. Visitation is projected to increase 38.2% as 427 million people attend in 2010. The revenue generated from these visits will increase 38.5% to \$12.6 billion.

Annual Amusement/Theme Park Attendance



Annual Revenue Generated from Amusement/Theme Parks



Trend	Amusement/Theme Park Attendance	+38.2%
	Revenue Generated from Amusement/Theme Parks	+38.5%

Significance Competition for disposable income and how money is spent may be of significance to the NPS. Experiences at amusement and theme parks may alter visitor expectations when visiting units of the National Park System.

Surprise Scenarios Changes in ticket prices, ride safety and technology, cultural perceptions of nature-based recreation, and virtual reality technology could influence the number of amusement and theme park visitors and the amount of money they will spend.

Source International Association of Amusement Parks and Attractions. (2000, August 3). Personal communications.

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