United States
Department of
Agriculture

Forest
Service

**Southwestern
Region**

November 2008

Coronado National Forest

Social and Economic Sustainability Report

Table of Contents

Introduction **1**
Historical Context **4**
Demographic and Economic Conditions **6**
Demographic Patterns and Trends 6
Total Persons 7
Population Age 7
Racial / Ethnic Composition 8
Educational Attainment 10
Housing 12
Urban and Rural Residence Trends 13
Relationship of Demographic Patterns and Trends to the Coronado NF 13
Economic Characteristics and Vitality 13
Employment 14
Occupational Structure 16
Income 18
Poverty 18
Payments to States 19
Relationship of Economic Characteristics and Vitality to the Coronado NF 22
Natural and Cultural Resource Dependent Economic Activity 22
Coronado NF Economic Contribution 23
Sustainability Discussion: Demographic and Economic 29
Land Use, Users, Access and Special Areas **31**
Land Ownership and Land Use 31
Land Ownership Patterns 32
Land Adjustments and Boundary Management 32
Long Range Land Use Plans and Local Policy Environment 33
Land Use and Land Ownership Trends 33
Access and Travel Patterns 34
Modes of Travel and Seasonal Flows 34
Planned Improvements 34
Barriers to Access 34
Forest Users and Uses 35
Traditional Uses 36
Production Uses 36
Recreational Uses 36
Illegal Uses 37
Designated Areas and Special Places 38
Officially Designated Areas 38
Natural, Cultural, Recreational, and Interpretive Resources 38
Sustainability Discussion: Land Ownership, Uses, Access, and Special Areas 38
Community Relationships **40**
Community Involvement with Natural and Cultural Resources 40
International Border 40
Communities of Interest and Historically Underserved Communities 40
Tribal Relations 40

Sustainability Discussion: Community Relationships....41
References 42
Appendix A: Economic Descriptions by County 44
Appendix B: Designated Areas on the Coronado NF....50
Appendix C: Recreation and Grazing Economic Contribution Process Paper 61

Introduction[1]

The purpose of this report is to profile the social and economic environment of the Coronado National Forest (NF) and the surrounding area. This information will serve as a baseline to evaluate the existing Land and Resource Management Plan for the Coronado National Forest, 1986 as amended (hereinafter referred to as the forest plan) to determine if parts of the Forest Plan need to change. It will do so by facilitating a better understanding of the relationship between National Forest System lands administered by the Coronado NF lands and lands in other ownerships (public and private) in surrounding communities, aiding in the identification of specific Forest Plan elements capable of responding to socioeconomic trends. Specifically, this report discusses the historical context, and demographic and economic conditions and trends, including particular issues affecting the interaction of communities with the Coronado NF. These issues include access and travel patterns, land use, types of users, and community-Forest relationships. The discussion highlights key points in the broader social, economic, and cultural context of the Coronado NF.

The boundaries of the Coronado NF abut the State of Sonora, Mexico, and extend into five State of Arizona Counties and State of New Mexico County. The area of assessment includes Pima, Graham, Pinal, Cochise, and Santa Cruz counties in Arizona, and Hidalgo County in New Mexico, as well as parts of Sonora, Mexico. The international border is an important social and cultural feature, as it influences a range of National Forest System land resources and uses, management issues, and interactions with other land management and law enforcement agencies. The following two figures display a map of Coronado NF boundaries and counties in the area of assessment (Figure 1), and the proximity of municipalities within a 100-mile radius (Figure 2).

1 This report is largely based on the University of Arizona School of Natural Resources (2005) Socio-Economic Assessment of the Coronado National Forest, prepared for the Southwest Region, USDA Forest Service. Text from that report is included here without further citation.

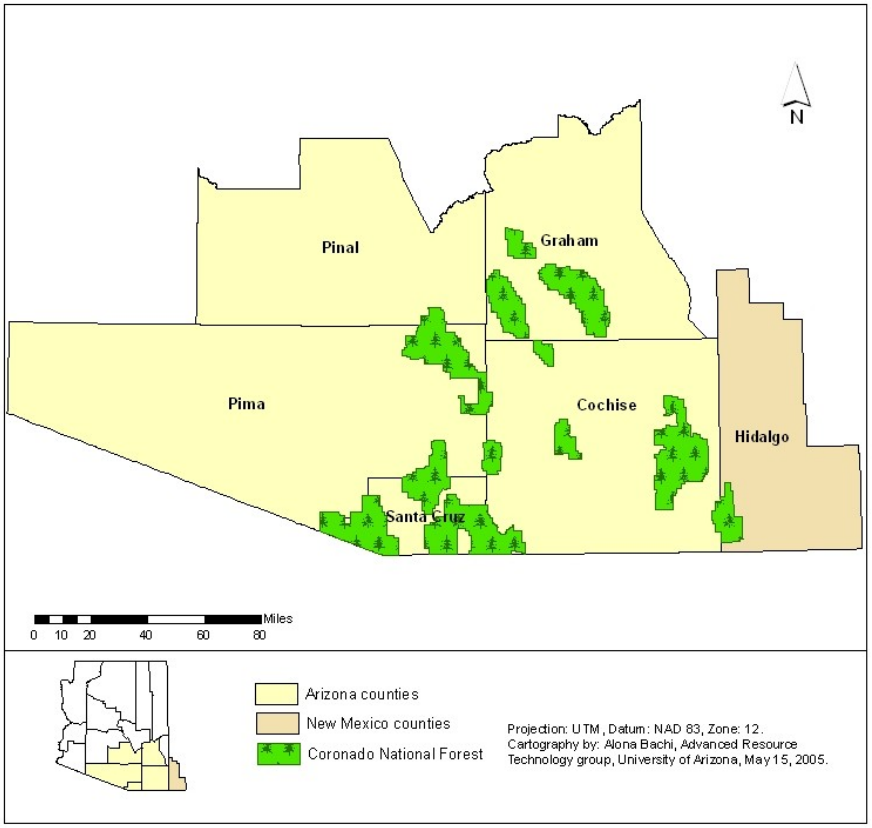


Figure 1: Map of Coronado NF Boundary and Counties in the Area of Assessment

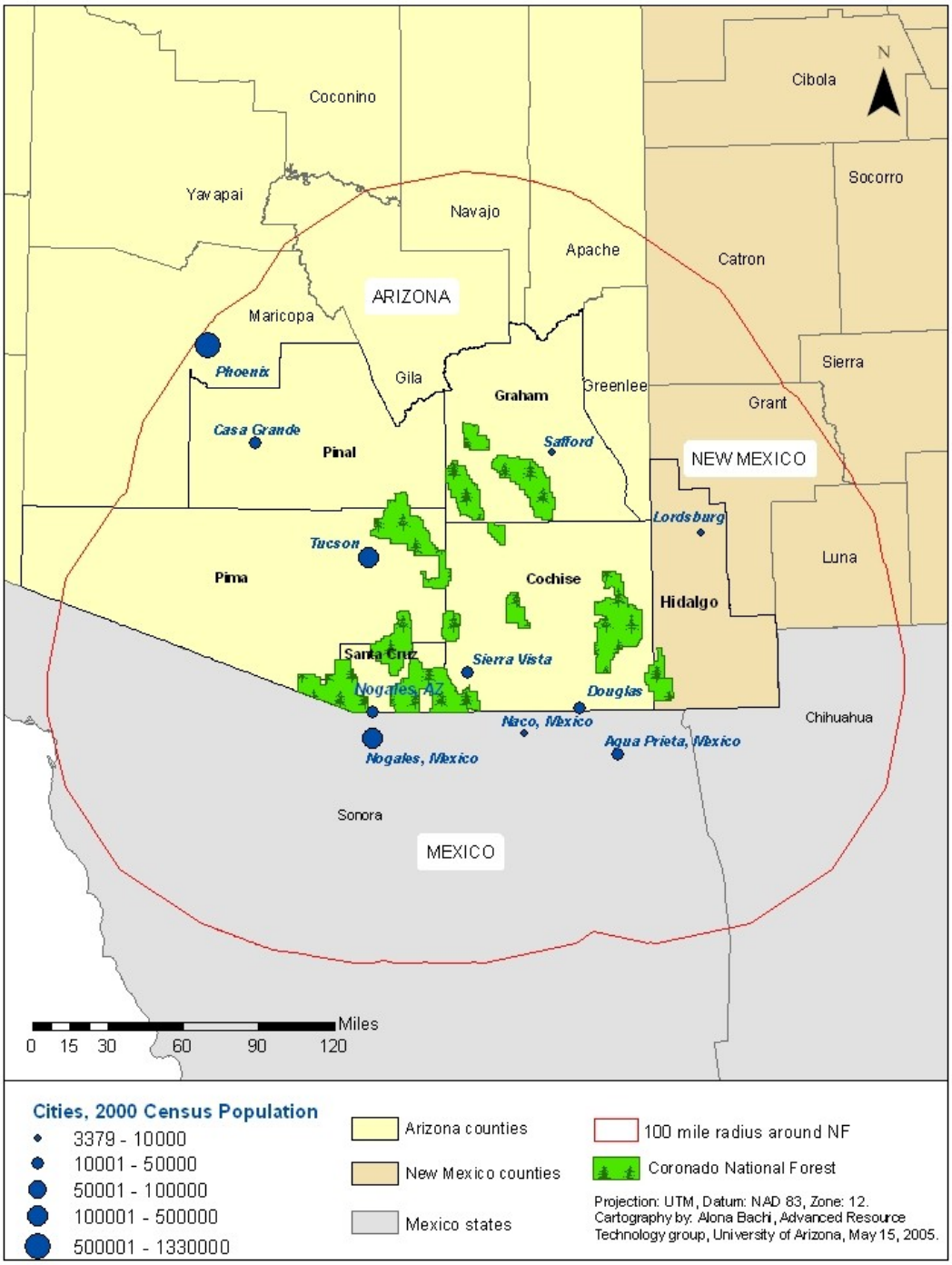


Figure 2: Proximity of Population – Municipalities within 100-mile Radius

Historical Context

Sheridan (1995) describes the time from the 15th to the 19th centuries in what is now the State of Arizona as the convergence of the Athapaskan (Apache and Navajo), Hispanic, and Anglo-American cultures on the Native American groups already living in that area, particularly the O'odham people (Akimel O'odham or Pima, Tohono O'odham, and related groups). As the first Hispanic missionaries entered central and southern Arizona, those areas were populated by Piman-speaking groups that may have descended from the much older Hohokam civilization. These groups farmed corn, beans, and squash along the region's rivers, particularly the Santa Cruz and San Pedro and their tributaries (Hadley and Sheridan 1995, Sheridan 1995).

In 1540, less than two decades after the Spanish entered the New World, Francisco Vasquez de Coronado entered what is now the modern southern boundary of the United States, most likely at a point on the San Pedro River in Cochise County. Coronado was in search of gold and precious minerals that legends claimed were to be found in the area, but of which the native tribes were unaware. At the time, of course, Coronado could not imagine the wealth in minerals under the surface that would later bring in a booming mining industry. Coronado and his troops continued into northern Arizona and New Mexico on an expedition in search of the mythical seven cities of Cíbola. While the sought-after treasures were never found, Coronado's entrada laid the groundwork for the process of Spanish colonization over the following 300 years. Coronado National Memorial, established through transfer of lands from the Coronado NF to the USDI National Park Service, commemorates the entry of Coronado into present-day Arizona (Sheridan 1995, Houston Institute 2005).

When the Jesuit missionary Padre Eusebio Kino entered modern southern Arizona in the late 17th century, Apaches and other raiding groups had banded together to attack these Piman-speaking groups and were in the process of either "displacing or assimilating" them (Hadley and Sheridan 1995). By the 18th century, the groups that later came to be known as Chiricahua Apaches had learned to tame wild Spanish horses and had spread throughout the Peloncillo, Dragoon, Dos Cabezas, Chiricahua, and probably Huachuca mountain ranges. Western Apache groups inhabited the Pinaleño, Galiuro, and other ranges in the northern portion of today's Coronado NF. They gathered wild foods, as well as engaging in some agriculture, and while generally preferring higher elevations than the Pimans, often descended from the highlands to raid the more agricultural settlements (Sheridan 1995).

In the 18th and 19th centuries, O'odham populations declined, through both emigration and high mortality rates in the face of Spanish and Mexican settlement and appropriation of riverine farmlands. The Apache groups resisted Euro-American settlement and colonization until the second half of the 19th century. The Treaty of Guadalupe-Hidalgo was signed in 1848, ending the U.S. war with Mexico and bringing California and New Mexico (including Arizona north of the Gila River) under U.S. control. With the 1853 Gadsden Purchase, southern Arizona, including Coronado NF lands and southwestern New Mexico, became U.S. territory. For nearly 40 years, continuing aggression between the Apaches and the westward-bound Americans kept the area sparsely populated.

The U.S.'s military conquest of Native American groups opened the doors to large-scale Anglo settlement. In the latter 19th century, increased mining activity at Tombstone, Bisbee, and other mining districts, and the arrival of the Southern Pacific Railroad in 1880, brought many more Euro-Americans to the area. Demand for timber and fuelwood led to intensive harvesting of the forests and woodlands of the mountains of southeastern Arizona. Cattle ranching increased greatly in the 1880s in southeastern Arizona, but was significantly reduced in the 1890s when serious drought years combined with over-stocking produced extreme range degradation.

The present day Coronado NF had its origins in 1902 when the Santa Rita, Santa Catalina, Mount Graham, and Chiricahua Forest Reserves were established to protect timber and watershed resources. In 1906, four additional Forest Reserves were proclaimed: the Huachuca, Tumacacori, Baboquivari, and Peloncillo FRs. The following year, the Dragoon National Forest was established. From 1908 through 1919 Forest units went through major changes with smaller Forests combined into two larger forests (the Coronado and Crook National Forests) by 1917, major additions (the Galiuro and Winchester Mountains), and major deletions (the Baboquivari Mountains and the bulk of the original Santa Rita FR). In 1927, two natural areas were put aside for scientific research, one in the Santa Catalina area. Three areas were transferred to the National Park Service for the creation of monuments or memorials: Chiricahua National Monument, established in 1924; Saguaro National Monument (now National Park) in 1933; and Coronado National Memorial in 1952. The last major changes in the units of the Coronado NF occurred in the 1950s when the Animas Mountains were dropped in 1951, the Crook National Forest was dissolved in 1953, and administration of the Pinaleño, Santa Teresa, Galiuro, and Winchester mountains transferred to the Coronado NF.

Today, the scattered holdings of the Coronado NF cover over 2,600 square miles of land ranging in elevation from 3,000 to over 10,000 feet (atop Mount Graham) in southeastern Arizona and southwestern New Mexico. The area is rich in vegetation zones including desert grasslands, mixed conifer forests comprised of Douglas-fir and ponderosa pine, and saguaro-covered desert, all of which harbor a diversity of wildlife including numerous bird species, reptiles, mammals, and large predators such as mountain lions and bears, even the occasional jaguar. Long stretches of grassland make it an historical grazing area, and its variety of elevations allows for year-round recreational use.

Demographic and Economic Conditions

Demographic Patterns and Trends

The recent demographic history of the area surrounding the Coronado NF, and the region as a whole, represents one of sustained and rapid growth. Since 1930, the mountain west has doubled its share of the U.S. population, from 3 percent to 6.5 percent. Growth increased dramatically in the 1950s and then declined again in the 1960s. This pattern of growth was repeated for the next 40 years, with alternating decades of intense growth followed by decades of slower growth (Otterstrom and Shumway 2003). Following a period of population loss in Cochise and Santa Cruz counties between 1920 and 1950, the Arizona counties into which the Coronado NF boundaries extend have grown steadily from 240,000 residents to over 1.2 million (Forstall 1995, U.S. Census Bureau 2005). Washington and Arizona are the only two states to show such startling demographic expansion (U.S. Census Bureau 2005). The average age in the state has been steadily increasing: 31 percent of the State's population was under 15 in 1950, but only 22.4 percent fall in the under-15 bracket today. Some of these shifts can be attributed to Arizona's amenable climate, relatively affordable property values, and the continued importance of area military bases. Long-term population increases are also supported by seasonal visitors wishing to permanently relocate to environs with increased outdoor opportunities (McHugh and Mings 1996).

Racial diversification has been limited in both Arizona and New Mexico over the past 50 or 60 years. While the Hispanic population in Arizona has increased from 20.4 percent to 25.2 percent of the population since 1940, the African American cohort, despite an especially rapid influx during the two decades following World War II and an average population growth rate of 49 percent per decade, has remained static at 3.1 percent of the population in 2000, only 0.1 percent above relative numbers in 1940. The Native American population as a percentage of total population, by contrast, has declined significantly over the past five or six decades, falling from 11 percent in 1940 to 5 percent in 2000 (U.S. Census Bureau 2005)[2]. Between 1940 and 2000, the Hispanic population of New Mexico rose from 221,331 to a high of 822,224, growing from 37 percent of the total population in 1940 to 43.6 percent in 2005.

Between 1940 and 2005, the Native American population in Arizona grew from 44,076 in 1940, to 275,321 in 2005. During that same time, the percentage of Native Americans as part of Arizona's total population declined from 11 percent in 1940 to 4.7 percent in 2005. In New Mexico, the Native American population in 1940 was estimated at 34,510, and grew to 181,064 by 2005, while the percentage of total population grew from 6.5 in 1940 to 9.6 in 2005. Although the percentage of Native Americans in the Arizona population has decreased, the absolute number is now greater than six times the 1940 figure. What makes the percentage appear to decrease is the fact that Arizona's total population has grown from 499,261, in 1940, to an estimate of more than 6,000,000, in 2006. New Mexico's Native American population has grown at a similar rate, while the overall population went from 531,818 in 1940 to 1,887,200 in 2005 (Combined US Census 1940 through 2000, and American Communities Survey for 2005 figures).

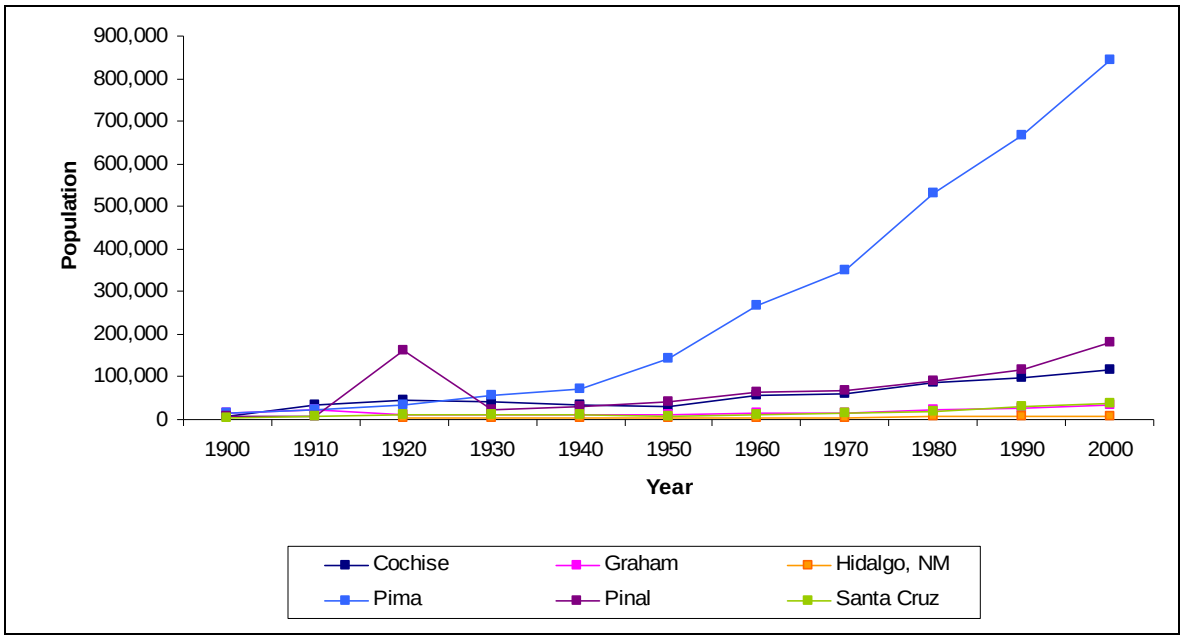
The past 50 years of increased growth is considered to be a marked pattern for the region, and this trend is expected to continue for the foreseeable future. As local populations increase, additional pressure for space continually affects the borders, integrity, and biodiversity of the federal lands

[2] The specific numbers for these historical comparisons are found at http://www.census.gov/population/documentation/twps0056/tab17.pdf in the U.S. Census Bureau website and are juxtaposed with the Census 2000 findings.

surrounding such growing communities as homes abut National Forest System land and a higher concentration of visitors travel to favored national forest destinations (USFS 1999a).

Total Persons

Data from the 1980, 1990, and 2000 censuses show that total population growth was greatest in Pinal and Santa Cruz counties over the 20-year period. However, total population growth within the entire six-county area of assessment was less than that for the State of Arizona as a whole over the same period (61 percent versus 89 percent respectively). In contrast, New Mexico's population growth for the same period was 40 percent (US Census Bureau 2000). Population growth was considerably less in the more rural areas of Cochise, Graham[3], and Hidalgo counties. Among individual cities, Oro Valley, Apache Junction, Nogales (Sonora), and Agua Prieta experienced the greatest increases in total population between 1980 and 2000.



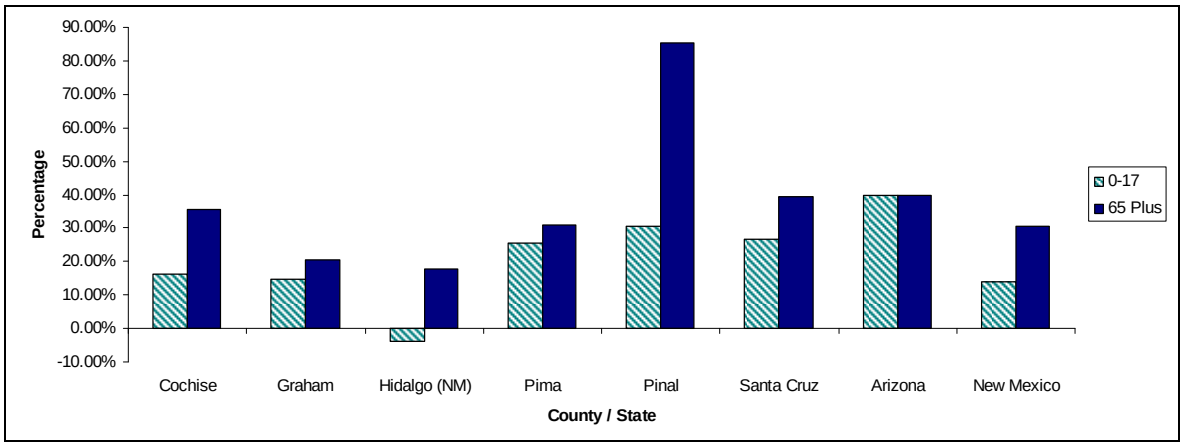
Source: U.S. Bureau of the Census 2000

Figure 3: Six-County Assessment Area Population Change, 1900-2000

Population Age

Within the area of assessment, the population of individuals age 65 and over grew at a much greater rate between 1980 and 2000 than that of those under age 18. The greatest disparities between the growth of the 65-and-over and under-18 populations were seen in Pinal, Hidalgo, Cochise, and Santa Cruz counties. The cities of Oro Valley, Catalina, and Apache Junction experienced increases in 65-and-over populations that were the largest among all of the selected cities within the area of assessment.

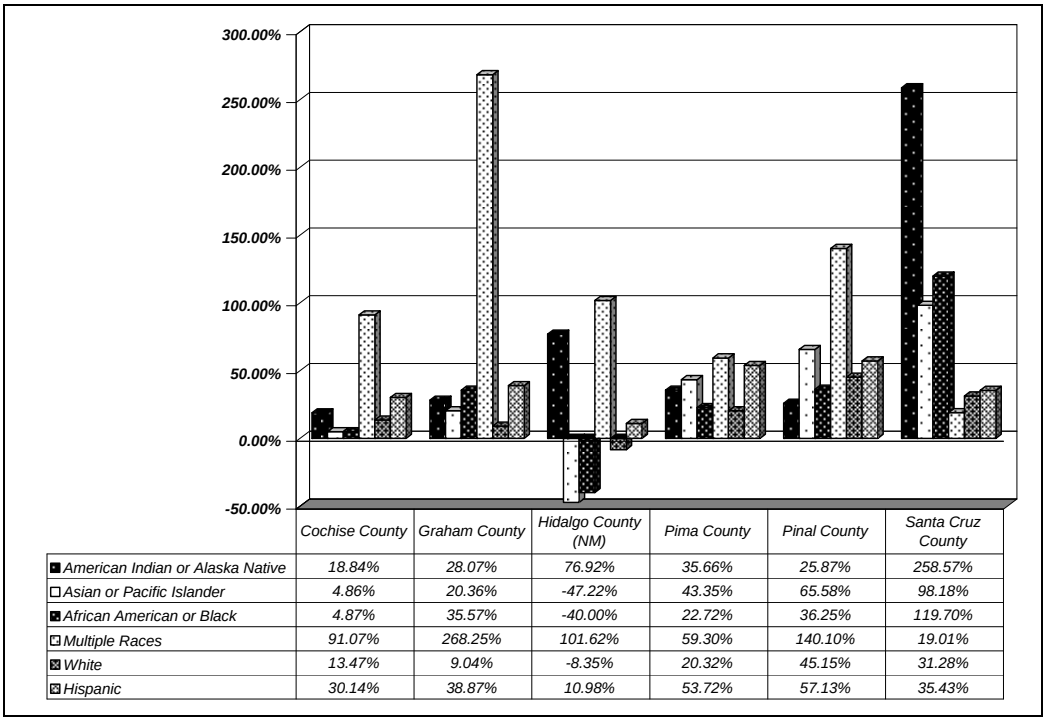
[3] The reported statistics do not reflect recent economic activity associated with the development of a large mine in Graham County following the 2000 Census.



Source: NRIS - Human Dimensions

Figure 4: Percent Change in Under-18 and 65+ Populations by County, 1990-2000

Racial / Ethnic Composition



	Cochise County	Graham County	Hidalgo County (NM)	Pima County	Pinal County	Santa Cruz County
American Indian or Alaska Native	18.84%	28.07%	76.92%	35.66%	25.87%	258.57%
Asian or Pacific Islander	4.86%	20.36%	-47.22%	43.35%	65.58%	98.18%
African American or Black	4.87%	35.57%	-40.00%	22.72%	36.25%	119.70%
Multiple Races	91.07%	268.25%	101.62%	59.30%	140.10%	19.01%
White	13.47%	9.04%	-8.35%	20.32%	45.15%	31.28%
Hispanic	30.14%	38.87%	10.98%	53.72%	57.13%	35.43%

Figure 5: Race/Ethnicity Percent Change by County

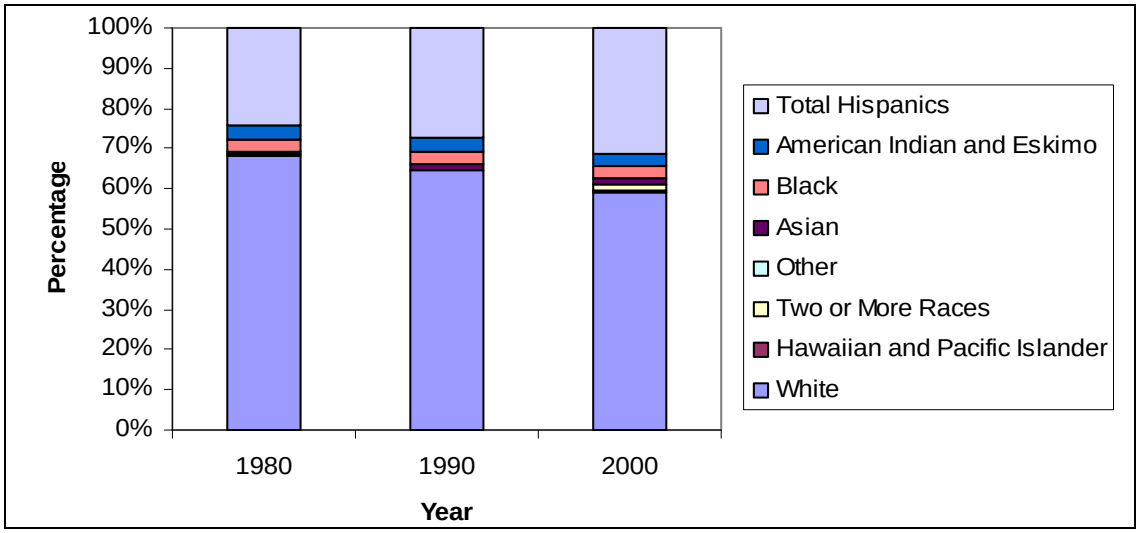
The decade between 1990 and 2000 saw a significant increase of multiple-race individuals in five of the six counties within the area of assessment, mirroring statewide trends for Arizona and New Mexico. The lone exception to this trend was Santa Cruz County, which saw an increase in the multiple-race population that was much lower than overall population growth for the county within the same period. Despite substantial increases in individuals of multiple-race and Hispanic ethnicity, whites remain the predominant racial group in each county within the area of assessment (de Steiguer 2005: 17, date from US Census Bureau 2000).

Table 1: Racial/Ethnic Composition of County and State Populations by Percentage, 1990-2000 and Change

	Cochise County (AZ)			Graham County (AZ)			Hidalgo County (NM)		
Race/Ethnicity	1990 %	2000 %	%Change	1990 %	2000 %	%Change	1990 %	2000 %	%Change
American Indian or Alaska Native	1.16	1.15	- 0.02	14.72	14.95	0.23	0.44	0.78	0.34
Asian or Pacific Islander	2.19	1.90	- 0.29	0.63	0.60	- 0.03	0.60	0.32	- 0.28
African American or Black	5.20	4.52	- 0.68	1.74	1.87	0.13	0.67	0.40	- 0.27
Multiple Races	9.96	15.77	5.82	5.30	15.48	10.18	7.27	14.72	7.45
White	81.49	76.66	- 4.83	77.62	67.11	- 10.51	91.02	83.78	- 7.24
Percent Non-white	18.51	23.34	4.83	22.38	32.89	10.51	8.98	16.22	7.24
Hispanic	28.44	30.69	2.25	24.55	27.04	2.49	50.27	56.04	5.77
	Pima County (AZ)			Pinal County (AZ)			Santa Cruz County (AZ)		
	1990 %	2000 %	%Change	1990 %	2000 %	%Change	1990 %	2000 %	%Change
American Indian or Alaska Native	3.00	3.22	0.22	9.58	7.81	- 1.77	0.24	0.65	0.42
Asian or Pacific Islander	1.82	2.06	0.24	0.58	0.62	0.04	0.37	0.57	0.20
African American or Black	3.13	3.03	- 0.09	3.13	2.76	-0.37	0.22	0.38	0.16
Multiple Races	13.11	16.51	3.40	11.79	18.33	6.54	24.30	22.36	- 1.94
White	78.94	75.07	- 3.87	74.92	70.42	- 4.50	74.87	76.00	1.13
Percent Non-white	21.06	24.93	3.87	25.08	29.58	4.50	25.13	24.00	- 1.13
Hispanic	24.15	29.34	5.19	29.35	29.86	0.51	77.15	80.78	3.63

	Arizona			New Mexico		
	1990 %	2000 %	%Change	1990 %	2000 %	%Change
American Indian or Alaska Native	5.58	4.99	- 0.59	8.85	9.54	0.69
Asian or Pacific Islander	1.48	1.93	0.45	0.95	1.14	0.19
African American or Black	3.00	3.10	0.09	1.97	1.89	- 0.08
Multiple Races	8.97	14.49	5.52	12.43	20.68	8.25
White	80.97	75.50	- 5.47	75.81	66.75	- 9.06
Percent Non-white	19.03	24.50%	5.47	24.19	33.25	9.06
Hispanic	18.57	25.25	6.68	38.06	42.08	4.02

Source: NRIS - Human Dimensions
Note: 1990 and 2000 data expressed as a percent of total population. Change illustrates the trends in proportional representation of various racial/ethnic groups in the overall population.



Source: NRIS - Human Dimensions

Figure 6: Six-County Assessment Area Racial/Ethnic Composition, 1980-2000[4]

Educational Attainment

Five of the six counties fall short of state averages in percentage of high school and college graduates. The exception is Pima County, which exceeded the average for the State of Arizona in both categories. Santa Cruz and Hidalgo Counties are clearly the most limited in terms of educational attainment of individuals age 25 and older. In Santa Cruz County, a full 20 percent of individuals have less than a 9th-grade education and only 60 percent have graduated from high school. Similar statistics are found in Hidalgo County, where nearly 18 percent of the 25-and-over population has less than a 9th-grade education and less than 10 percent hold a college degree.

[4] "Total Hispanics" indicates all Hispanics regardless of race, since the ethnic category of "Hispanic" can include any racial group.

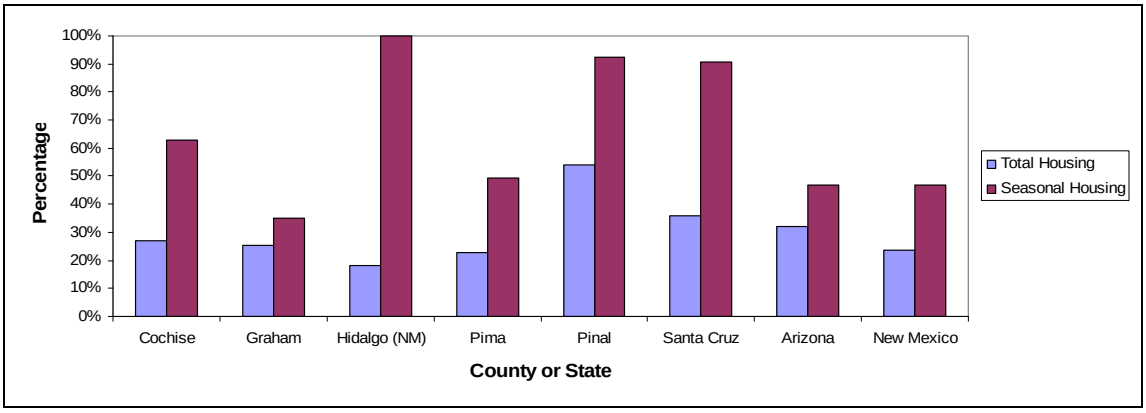
Table 2: Educational Attainment of County and State Populations 25 Years Old and Over

	Cochise County (AZ)		Graham County (AZ)		Hidalgo County (NM)		Pima County (AZ)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Population Over 25	75,774	100	19,302	100	3,596	100	546,200	100
Less than 9th grade	7,112	9.4	1,703	8.8	642	17.9	34,722	6.4
9th to 12th grade, no diploma	8,451	11.2	3,011	15.6	480	13.3	55,761	10.2
High school graduate (includes equivalency)	18,670	24.6	5,811	30.1	1,328	36.9	127,343	23.3
Some college, no degree	20,742	27.4	4,782	24.8	696	19.4	145,579	26.7
Associate degree	6,552	8.6	1,711	8.9	94	2.6	36,687	6.7
Bachelor's degree	9,390	12.4	1,234	6.4	224	6.2	86,752	15.9
Graduate or professional degree	4,857	6.4	1,050	5.4	132	3.7	59,356	10.9
Percent high school graduate or higher	(x)	79.5	(x)	75.6	(x)	68.8	(x)	83.4
Percent bachelor's degree or higher	(x)	18.8	(x)	11.8	(x)	9.9	(x)	26.7
	Pinal County (AZ)		Santa Cruz County (AZ)		Arizona		New Mexico	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Population 25-years and over	119,102	100	22,445	100	3,256,184	100	1,134,801	100
Less than 9th grade	12,681	10.6	4,588	20.4	254,696	7.8	104,985	9.3
9th to 12th grade, no diploma	19,832	16.7	4,242	18.9	364,851	11.2	134,996	11.9
High school graduate (includes equivalency)	36,255	30.4	5,124	22.8	791,904	24.3	301,746	26.6
Some college, no degree	29,418	24.7	4,191	18.7	859,165	26.4	259,924	22.9
Associate degree	6,739	5.7	898	4.0	219,356	6.7	67,001	5.9
Bachelor's degree	8,964	7.5	2,008	8.9	493,419	15.2	154,372	13.6
Graduate or professional degree	5,213	4.4	1,394	6.2	272,793	8.4	111,777	9.8
Percent high school graduate or higher	(x)	72.7	(x)	60.7	(x)	81.0	(x)	78.9
Percent bachelor's degree or higher	(x)	11.9	(x)	15.2	(x)	23.5	(x)	23.5

Source: U.S. Census Bureau, Census 2000 Summary File http://www.census.gov/census2000/states/az.html

Housing

Increases in total housing and housing density were greatest in Pinal and Santa Cruz counties between 1990 and 2000, mirroring growth in the State population as a whole. Among selected cities, Catalina and Oro Valley experienced the greatest increases in total housing units over the 10-year period. A clear trend in each of the six counties was the significant increase in the number of houses for seasonal use. Seasonal housing increases exceeded State averages for five of the six counties, the lone exception being Graham County which saw only a 35 percent increase in seasonal housing.



* For purposes of graphing, increase in seasonal housing for Hidalgo County, New Mexico is shown at 100.00 percent when in fact the increase was 672 percent. The actual increase was minimal from 11 to 85 seasonal units. Source: NRIS - Human Dimensions

Figure 7: Percent Change in Total and Seasonal Housing Units by County, 1990-2000

Of the selected cities within the area of assessment, Catalina, Benson, Wilcox, and Douglas, Arizona all saw seasonal housing units increase by over 700 percent during the 10-year period between 1990 and 2000. Pinal and Santa Cruz counties experienced the greatest increases in both total housing units and seasonal housing units between 1990 and 2000. Total and seasonal housing growth was particularly strong in Pinal County at 54 percent and 92 percent respectively.

Census data from INEGLI suggest that growth in total housing units was strong for the State of Sonora, Republic of Mexico in general and for the cities of Agua Prieta and Nogales in particular. Between 1990 and 2000, these two cities experienced increases in total housing units of 77 percent and 68 percent, respectively. Statistics on seasonal housing units, housing density, and median home value were not available for municipalities in Sonora at the time of this assessment.

Urban and Rural Residence Trends

Table 3: Urban and Rural County Populations, 1980-2000 and Percent Change

County		1980*			1990			2000		
		Population	% of total	% Change	Population	% of total	% Change	Population	% of total	% Change
Cochise	Urban	52,582	61.37	n/a	68,359	70.02	30	78,163	66.38	14.34
	Rural	33,104	38.63	n/a	29,265	29.98	-11.6	39,592	33.62	35.29
Graham	Urban	10,384	45.42	n/a	11,122	41.88	7.11	14,829	44.28	33.33
	Rural	12,478	54.58	n/a	15,432	58.12	23.67	18,660	55.72	20.92
Hidalgo NM)	Urban	3,195	52.82	n/a	2,922	49.04	-8.54	2,986	50.34	2.19
	Rural	2,854	47.18	n/a	3,036	50.96	6.38	2,946	49.66	-2.96
Pima	Urban	450,059	84.69	n/a	616,159	92.39	36.91	772,162	91.52	25.32
	Rural	62,633	11.79	n/a	50,721	7.61	-19.02	71,584	8.48	41.13
Pinal	Urban	9,935	10.93	n/a	68,908	59.21	593.59	116,082	64.59	68.46
	Rural	36,841	40.52	n/a	47,471	40.79	28.85	63,645	35.41	34.07
Santa Cruz	Urban	15,683	76.66	n/a	19,489	65.67	24.27	25,939	67.58	33.1
	Rural	4,776	23.34	n/a	10,187	34.33	113.3	12,442	32.42	22.14

*Does not account for farming populations

N.B.: Percent Total is the percentage of total population. Percent change is the percentage of change from prior census year.
Source: NRIS - Human Dimensions

Relationship of Demographic Patterns and Trends to the Coronado NF

Rapid population growth and expansion of development are key demographic trends that have implications for management of the Coronado NF. As the major provider of recreational settings in the area, the Coronado NF has experienced increased visitation as surrounding populations have increased. Many of the new residents are older, and live in the area seasonally. This may mean that there will be a greater demand for accessible recreation experiences in the future. Another major trend is development overall, and development of rural areas especially. For the Coronado NF, this means additional challenges in establishing access to National Forest Lands, and even in maintaining traditional access points (see Access and Travel Patterns). Rural (or "ex-urban") development also means a loss of open space along Forest boundaries (see Land Use and Landownership Patterns).

Economic Characteristics and Vitality

The State of Arizona has undergone a relatively rapid transformation over the past century. During the first half of the century, mining, agricultural, and ranching industries dominated the economy. The state's population increased dramatically following World War II and continues to increase today. Economic dominance has shifted to a mix of urban and rural industries that cover nearly every sector. Industrial diversity increased from the 1970s until it peaked in the mid-1980s and has now fallen well below other states to 0.45 on the Industrial Diversity Index[5] (Arizona Department of Commerce 2002a).

Per capita personal income in the State of Arizona has generally followed national trends, although it has shown greater fluctuation in the short term. Labor force growth has slowed since

[5] An index of 1.0 represents a state of industrial diversity that is equal to the United States as a whole. Although Arizona's economy is no longer limited to agricultural and mining interests, it is still restricted in its industrial array. By contrast, states like Texas and Illinois have indexes near 0.8, suggesting a much broader industrial foundation.

the 1970s when it peaked at an annual rate of 2.7 percent. It slowed to 1.7 percent in the 1980s and to 1.2 percent in the 1990s. The impact of education on economic standing has increased with the wages of college-educated workers increasing dramatically since 1975 to more than 1.85:1 above high school educated workers. Poverty rates have remained relatively stable over the last three to four decades remaining between 14 and 16 percent (Sheridan 1995, Canamex 2001, Arizona Department of Commerce 2002a).

Mining represented 3 percent of the State's per capita income in the late 1960s, but was a fraction of a percent by 2002. Agriculture also represents less than 1 percent. Manufacturing and trade/utilities have either remained static or dropped slightly in the second half of the past century. The service industry, however, jumped from 13 percent in 1969 to more than 20 percent in 2002. This trend is due largely to the increasing urbanization of the state, with 88.2 percent of the population living in urban areas according to the 2000 Census. The concentration of economic activity in metropolitan areas is reflected in a per capita personal income of $27,285 compared to $18,992 in non-metropolitan areas, a 30.4 percent differential, up from 23.3 percent in 1970.

Many of the counties surrounding the Coronado NF are among the poorest in the States of Arizona and New Mexico. The 2002 per capita personal income in the six U.S. counties abutting the Forest was $19,687, or 26.2 percent less than the state average for Arizona. However, this number is very close to the 2002 per capita personal income of $19,230 for the State of New Mexico. When compared to the national average, workers in these Arizona counties earn only 63.9 percent of the Arizona per capita income. The 30-year average rate of income growth in this region was 8.4 percent, well below the state average of 10.2 percent.

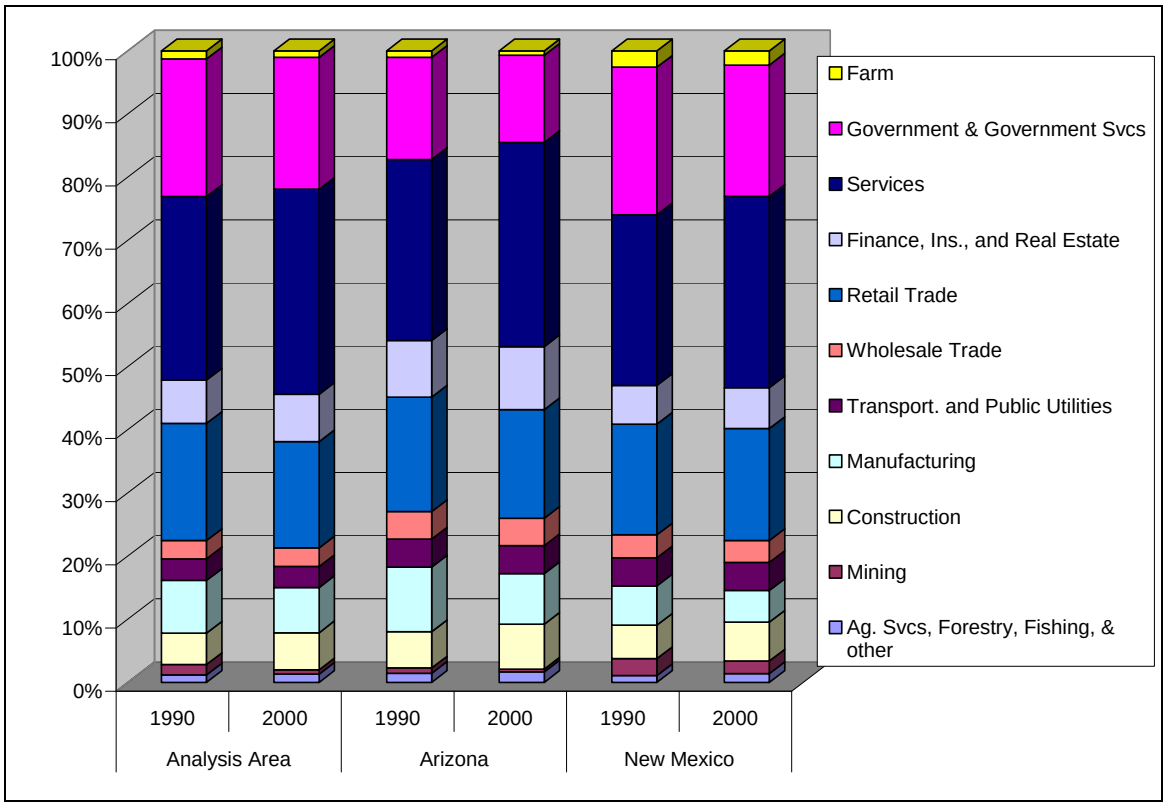
Employment

Economic growth for the area of assessment was relatively limited between 1990 and 2000. Gains in total full- and part-time employment for each of the six counties in the area of assessment were below those for their corresponding states between 1990 and 2000. Although each of the counties in Arizona witnessed a substantial increase in construction jobs, none of them matched the rate of increase in construction employment for Arizona overall, which was nearly 84 percent between 1990 and 2000. Considerable job losses in the mining sector were reported for Cochise, Pinal, and Santa Cruz counties, reflecting a similar trend for the State of Arizona as a whole. Contrary to this trend, Graham County has recently seen large increases in mining sector employment. Within the area of assessment, significant gains were made between 1990 and 2000 in the finance, insurance, and real estate industries, as well as the service and government sectors.

Table 4: Total Employment and Employment by Type, 1990-2000 with Percentage of Change

Location	Employment			Wage and salary employment			Farm proprietor employment			Non-farm proprietor employment		
	1990	2000	% change	1990	2000	% change	1990	2000	% change	1990	2000	% change
Cochise County, AZ	40,595	50,792	25.12	33,814	40,031	18.39	943	986	4.56	5,838	9,775	67.44
Graham County, AZ	7,753	10,562	36.23	6,141	8,252	34.38	383	356	- 7.05	1,229	1,954	58.99
Hidalgo County, NM	2,838	2,388	- 15.86	2,393	1,875	- 21.65	145	157	8.28	300	356	18.67
Pima County, AZ	321,710	444,366	38.13	267,918	363,960	35.85	495	486	- 1.82	53,297	79,920	49.95
Pinal County, AZ	41,577	50,262	20.89	34,947	41,939	20.01	807	747	- 7.43	5,823	7,576	30.10
Santa Cruz County, AZ	13,489	15,830	17.35	11,328	12,816	13.14	186	180	- 3.23	1,975	2,834	43.49
Arizona	1,909,879	2,819,302	47.62	1,607,628	2,355,299	46.51	8,027	7,572	- 5.67	294,224	456,431	55.13
New Mexico	767,139	972,954	26.83	635,725	789,690	24.22	13,600	14,985	10.18	117,814	168,279	42.83

(Source: University of Arizona School of Natural Resources 2005)



Source, University of Arizona School of Natural Resources 2005

Figure 8: Analysis Area, Arizona, and New Mexico Industry Distribution 1990 -2000

Unemployment rates across the analysis area are indicators of the economic challenges within these counties. Average county unemployment rates from 1980 to 2004 range from 3.9 percent in Pinal County to 16.0 percent in Santa Cruz County. All exceed the average for their respective state, except Pinal County. Santa Cruz is the only county to experience double-digit unemployment. The City of Nogales within Santa Cruz County had an average unemployment rate of 20.3 percent during this period. Other communities within the analysis area have also experienced long periods of double-digit unemployment: Douglas in Cochise County, Arizona; Lordsburg in Hidalgo County, New Mexico; and Eloy in Pinal County, Arizona.

Occupational Structure

Data show that five of the six counties within the area of assessment maintain occupational structures very similar to those of the States of Arizona and New Mexico as a whole. The grouping of (a) management, professional, and related occupations is the dominant occupational category for both states followed by (b) sales and office occupations and, finally, by (c) service occupations. The exception is Hidalgo County, New Mexico where service was slightly more predominant than either sales and office occupations or management, professional, and related occupations as of 2004. For each of the counties within the area of assessment, the occupational categories of (e) construction, extraction, and maintenance; and (f) production, transportation, and material moving, were among the five most dominant occupational categories.

Table 5: Dominant Occupations of State and County Populations, 2000

	Cochise County, AZ		Graham County, AZ		Hidalgo County , NM		Pima County, AZ		Pinal County, AZ		Santa Cruz County	
Occupations	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Construction, extraction, and maintenance occupations	4,559	10.7	1,751	16.4	369	17.4	39,765	10.7	8,727	14.2	1,264	9.8
Management, professional, and related occupations	12,876	30.2	2,769	25.9	435	20.5	129,709	35	13,523	22.1	3,229	25.1
Production, transportation, and material moving occupations	4,001	9.4	1,232	11.5	300	14.2	34,698	9.4	8,998	14.7	1,900	14.8
Sales and office occupations	11,543	27.1	2,516	23.5	441	20.8	100,527	27.1	14,937	24.4	4,202	32.6
Service occupations	9,075	21.3	2,219	20.8	477	22.5	65,326	17.6	13,432	21.9	2,109	16.4

	Arizona		New Mexico	
Occupations	**Number**	**Percent**	**Number**	**Percent**
Construction, extraction, and maintenance occupations	245,578	11	87,172	11.4
Management, professional, and related occupations	730,001	32.7	259,510	34
Production, transportation, and material moving occupations	244,015	10.9	81,911	10.7
Sales and office occupations	636,970	28.5	197,580	25.9
Service occupations	362,547	16.2	129,349	17

Source: U.S. Census Bureau, American Fact Finder http://factfinder.census.gov

Income

As of 2000, each of the six counties within the area of assessment maintained levels of per capita and median family income that were lower than state averages. Pinal County saw the greatest increases in per capita and median family income between 1990 and 2000. In the State of Arizona counties assessed, with the exception of Pinal County, per capita personal incomes increased at a much slower rate since 1990 than for the state as a whole. Growth in Pinal County was 31.7 percent, more than double Arizona's increase of 14.3 percent. In Hidalgo County, New Mexico, per capita personal income decreased by 6.5 percent. Increases in median family incomes exceeded the state's rate of increase in Cochise, Graham and Pinal Counties. However, two counties, Hidalgo County, New Mexico and Santa Cruz, Arizona experienced a decrease in median family income. Per capita and median family income figures for the State of Sonora, Republic of Mexico, and selected border communities as of 2000 are much lower than areas within the United States. However, the cities of Agua Prieta and Nogales both reported individual and median family incomes that were higher than those for the State of Sonora as a whole.

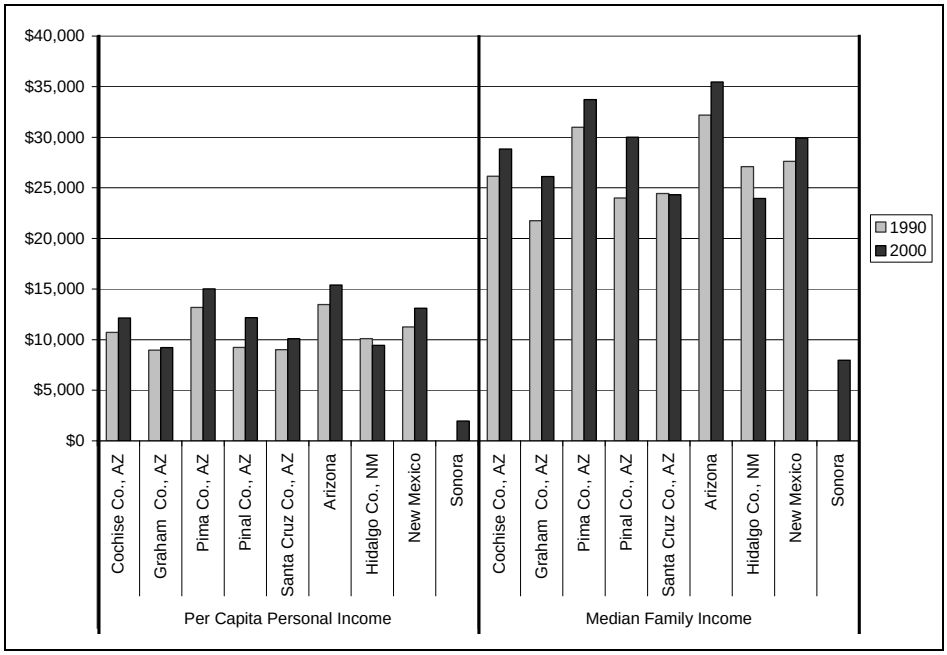


Figure 9: Per Capita Personal Income and Median Family Income, 2000

Poverty

Both Pinal and Graham counties saw substantial declines in individual and family poverty that was greater than reductions in poverty at the state level over the same period. Nonetheless, as of 2000, each of the counties maintained rates of poverty greater than those for its respective state. Within the area of assessment, Hidalgo County, New Mexico and Santa Cruz County, Arizona reported the highest rates of individual and family poverty as of 2000.

In Mexico, the Secretaría de Desarrollol Social (SEDOSOL) defines families in *pobreza de patrimonio* as those who cannot afford the basic demands of a nutritional diet, dress, footwear, dwelling, health, public transportation, and education (SEDOSOL 2002). While rates are high in the State of Sonora as a whole, each of the selected border cities reported rates of individual and family poverty that were lower than the average for the state.

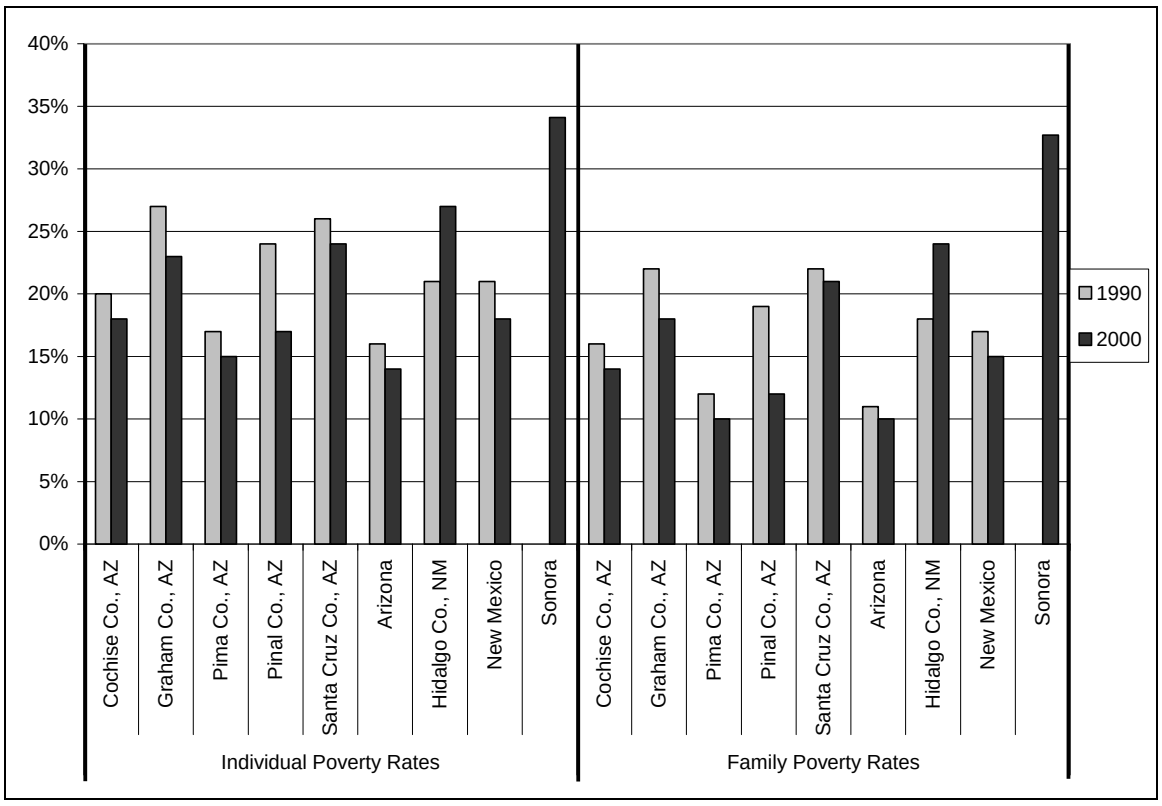


Figure 10: Individual and Family Poverty Rates, 1990-2000

Payments to States

Counties receive Payment in Lieu of Taxes (PILT) to replace tax revenue lost due to the public nature of lands administered by federal agencies (*1976 Payments in Lieu of Taxes Act*). The amount is based on the amount of acreage administered by certain federal agencies, population, a schedule of payments, the Consumer Price Index, other federal payments made in the prior year, and the level of funding allocated by Congress. These payments are not affected by changes in the Forest Plan.

In addition to PILT payments, counties receive a portion of the revenues generated on National Forest System lands. Historically, counties have received 25 Percent Fund payments. These payments returned 25 percent of all revenues generated from national forest management activities, with the exception of certain mineral programs, and were paid based on the acreage of National Forest System lands within each county. These funds are used for the upkeep and maintenance of public schools and roads. These payments are affected by changes in resource output levels as a result of direction provided in the Forest Plan.

In 2000, however, Congress enacted the *Secure Rural Schools and Community Self-Determination Act* (SRSCS). This Act was designed to stabilize annual payments to states and counties for the next 6 years beginning in 2001. The formula for computing annual payments is based on averaging a state's three highest payments between 1986 through 1999 to arrive at a compensation allotment or "full payment amount." The Act also creates citizen advisory committees and gives local communities the choice to fund restoration projects on federal lands or in counties. The SRSCS requires a county that elects to receive its share of the full payment amount to spend no less than 80 percent and no more than 85 percent of the funds in the same manner as the 25 Percent Fund payments are expended. The balance of the payment must be reserved for special projects on federal lands or for county projects, or the reserved fund must be returned to the United States General Treasury. If a county's share of the full payment amount is less than $100,000, all of the funds may be spent in the same manner as the 25 Percent Fund payments. Changes in the Forest Plan do not affect the level of these payments.

Counties could choose to continue to receive payments under the 25 Percent Fund or to receive the county's proportionate share of the state's full payment amount under SRSCS. All counties within the analysis area elected to receive their proportionate share of the State's full payment amount. Table 6 displays the PILT and SRSCS payments to each county from 2002 through 2006.

Table 6: PILT and SRSCS Payments by County, 2002-2006

	2002 ($)	2003 ($)	2004 ($)	2005 ($)	2006 ($)
Cochise County, AZ					
PILT	565,264	630,385	666,300	679,921	674,276
SRSCS	92,386	93,125	94,242	95,467	97,663
Total	657,650	723,510	760,542	775,388	771,939
Graham County, AZ					
PILT	457,321	520,435	512,637	523,531	540,377
SRSCS	74,759	75,357	76,262	77,253	79,030
Total	532,080	595,792	588,899	600,784	619,407
Hidalgo County, NM					
PILT	39,595	40,010	41,123	42,709	52,831
SRSCS	13,270	13,274	13,433	13,608	12,530
Total	52,865	53,284	54,556	56,317	65,362
Pima County, AZ					
PILT	412,998	468,930	463,573	470,445	469,051
SRSCS	72,328	72,907	73,781	74,741	76,460
Total	485,326	541,837	537,354	545,186	545,511
Pinal County, AZ					
PILT	258,811	290,098	299,711	306,347	308,501
SRSCS	4,882	4,921	4,980	5,029	5,145
Total	263,693	295,019	304,692	311,376	313,646
Santa Cruz County, AZ					
PILT	594,886	565,710	578,734	594,420	555,534
SRSCS	79,014	79,646	80,602	81,650	83,528
Total	673,900	645,356	659,336	676,070	639,062

However, SRSCS is scheduled to expire at the end of 2006. At the date of this writing, Congress has yet to take action to extend the Act. If the SRSCS is extended, county payments would continue as detailed above. If the SRSCS is not extended, payments under the 25 Percent Fund would be resumed. The 10-year average for receipts from 1990 to 1999 are displayed by county in Table 7 below along with the estimated payment that each county would be expected to receive if payments under the 25 Percent Fund were to resume.

Table 7: Ten-Year average Forest Receipts by County and Estimated 25 Percent Fund Payment

County	Average Forest Receipts (1990-1999)	Estimated Payment Under 25 Percent Fund
Cochise County, AZ	58,500	14,625
Graham County, AZ	47,300	11,825
Hidalgo County, NM	8,900	2,225
Pima County, AZ	45,800	11,450
Pinal County, AZ	29,400	7,350
Santa Cruz County, AZ	50,000	12,500

Relationship of Economic Characteristics and Vitality to the Coronado NF

Over the past 50 years, the main economic drivers for the area surrounding the Coronado NF have shifted away from mining and agriculture toward service related industries. This underscores the importance of the Coronado NF to tourist related businesses that serve those who travel to visit National Forest Lands. In addition, many of the counties surrounding the Coronado NF are among the poorest in their respective states. This may be a reflection of the relatively low wages associated with the service industry. It also implies that local residents may not have discretionary income available for expensive recreation or travel. Access to nearby National Forest Lands is likely very important to local residents for leisure activities.

Natural and Cultural Resource Dependent Economic Activity

Tourism is the largest economic activity associated with natural settings in the planning area. Cochise, Graham, and Pima Counties, Arizona reported the greatest increases in tourism employment between 1990 and 2000. The natural, cultural, and historic resources of the Coronado NF play a large role in attracting visitors to the area. In Pima County, Sabino Canyon was the second-most visited tourist attraction in 2006. Attractions include not only natural beauty and opportunities to experience nature, but also visitation of historic sites. A study by the Arizona Humanities Council said that more than half of the state's visitors visit historic sites. Several sites on the Coronado NF offer opportunities for heritage tourism.

The area of assessment experienced a relatively strong increase in income from wood products and processing between 1990 and 2000, outstripping gains at the state level over the same period. Meanwhile, losses in income from special forest products and processing were also greater than those for the State of Arizona as a whole. Harvest of wood from the Coronado NF is almost entirely limited to firewood, and so there is no direct link between wood products and processing and the Coronado NF.

Land in the planning area is highly mineralized, and mining activity mirrors market prices for mineral commodities. After a period of low market prices in the late 1990's, metals began to show some strength in 2005. By 2006 the prices for many mineral commodities were breaking historic records. These increases are reflected in the increased level of both mineral exploration and proposed mine development activity on Coronado NF lands[6]. Although metal prices are cyclic and prices may fall back below these historic highs, metal prices are expected to remain high relative to production costs for several years to come. This means that the Coronado NF can expect increased interest in mineral-related activity over the next several years.

Range livestock production is an extensive economic land use in the assessment area, and approximately 90 percent of the Coronado NF lies within 186 identified grazing allotments. This is a long-term land use that

[6] The number of legitimate commercial mining operations on the Coronado NF increased from one (1) in 2001, to 12 in 2006-2007

predates the establishment of the Coronado NF. Many area ranchers depend on grazing permits issued by the Coronado NF in order to have viable livestock operations. The economic return from ranching is difficult to assess because of foregone opportunity costs, the interactions of livestock production activities with other economic sectors, and non-economic values tied to ranching as a way of life. These non-economic values can include having a working relationship with the land, owning livestock, commitment to community, land stewardship, continuing a family tradition, and the ability to pass on the operation to future generations (Eastman et al, 2000, Raish and McSweeney, 2003, Conley et al, 2007). Still, in the assessment area ranching can be considered a noteworthy economic contributor, especially in counties with smaller and less diverse economies such as Cochise, Graham, Santa Cruz Counties, Arizona; and Hidalgo County, New Mexico.

The number of Animal Unit Months (a measure of the amount of forage harvested) authorized on the Forest decreased by 23 percent from 1986 to 2006. During that same period the number of Coronado NF livestock grazing permits decreased from 175 to 158.

Coronado NF Economic Contribution

The following two pie charts display the relative size of the natural resource related sectors to the economy of the analysis area as a whole. Figure 11 displays labor income and Figure 12 displays employment. Labor income from natural resource related sectors represents only 3 percent of the totals for the analysis area, but approximately 5.4 percent of employment. Note that 2.3 percent of labor income is attributed to tourism, as compared to 4.2 percent of employment indicating relatively low wages typical of this service industry. It should be remembered that the contributions of the Coronado NF represent only a portion of the economic activity reflected in the natural resource related sectors.

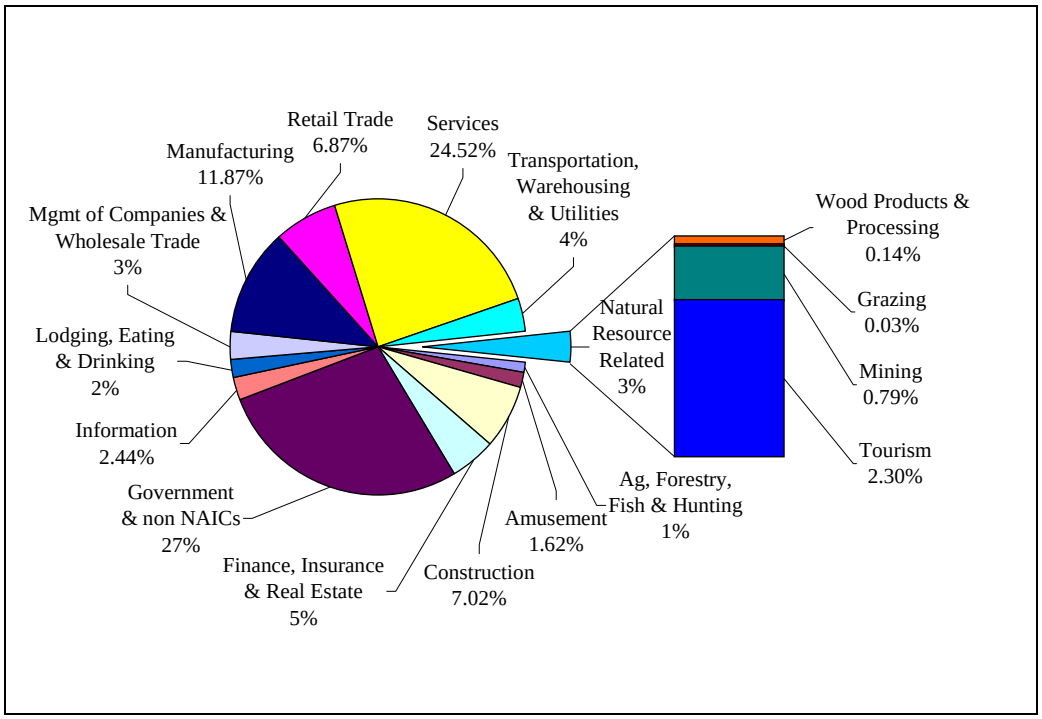


Figure 11: 2002 Analysis Area Labor Income (IMPLAN)

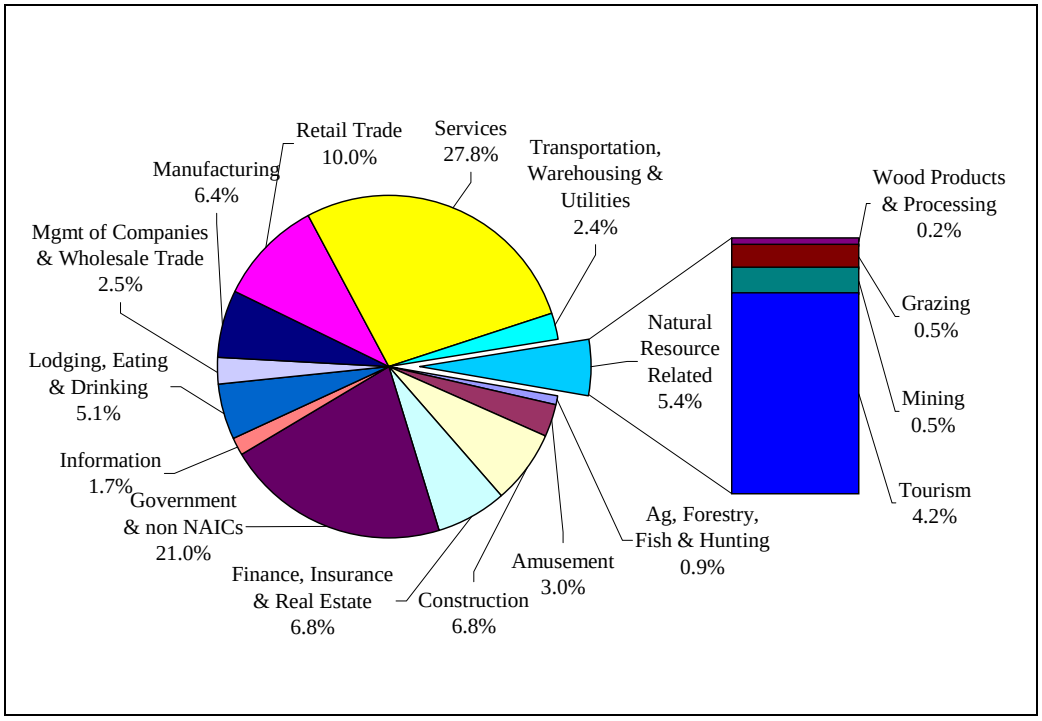


Figure 12: 2002 Analysis Area Employment (IMPLAN)

Labor income and employment data in Figures 11 and 12 reflect only direct impacts of natural resource related industries, or those that result in response to demand for natural resource goods and services; however, indirect and induced effects are not represented. Indirect effects are produced when a sector must purchase supplies and services from other industries in order to produce output sufficient to meet demand. Induced effects represent the employment and labor income stimulated throughout the local economy because of the expenditure of new household income generated by direct and indirect employment.

IMPLAN[7] attempts to estimate these complex economic relationships in order to approximate the effect of each sector on the economy as a whole. The estimated direct, indirect, and induced labor income and employment contributions of current activities on the Coronado NF are displayed in Tables 8 and 9 following.

[7] IMPLAN ("IMpact analysis for PLANing, Minnesota IMPLAN Group, Inc.), is a regional economic impact analysis system, that uses county-level, input-output data to determine the extent to which these activities (such as livestock grazing) contribute to the local economy. Input-output analysis is an economist's tool that traces linkages among the structural parts of an economy and calculates the employment, income, and output effects resulting from a direct impact on the economy.

Table 8: Coronado NF Estimated Employment Contribution by Resource Program

Forest Economic Contribution Source	Number of Jobs Contributed		
	Total Forest Contribution	Estimated Contribution of the Recreation Activities of Local Residents	Amount of Forest Contribution that Represents the Introduction of New Money into the Local Economy
Recreation	1,108	553	555
Wildlife and Fish	146	80	66
Grazing	79	0	79
Timber	0	0	0
Minerals	0	0	0
Payments to States/Counties	10	0	10
Forest Service Expenditures	535	0	535
Total Forest Management	1,878	633	1,245
Percent of Total Employment	100%	34%	65.6%

Source: IMPLAN

Table 9: Coronado NF Estimated Labor Income Contribution by Resource Program

Forest Economic Contribution Source	Thousands of 2006 Dollars		
	Total Forest Contribution ($)	Estimated Contribution of the Recreation Activities of Local Residents ($)	Amount of Forest Contribution that Represents the Introduction of New Money into the Local Economy ($)
Recreation	30,255.5	15,798.6	14,456.9
Wildlife and Fish	4,008.4	2,295.2	1,713.2
Grazing	1,354.3	0.0	1,354.3
Timber	3.4	0.0	3.4
Minerals	0.0	0.0	0.0
Payments to States/Counties	375.7	0.0	375.7
Forest Service Expenditures	25,155.4	0.0	25,155.4
Total Forest Management	61,152.8	18,093.8	43,059.0
Percent of Total Labor Income	100%	30%	70%

Source: IMPLAN

The recreation program area stimulates the greatest level of employment and labor income of the Forest programs. However, 34 percent of the estimated employment and 30 percent of the estimated labor income are attributed to recreation activities of local residents. While providing recreation opportunities to local residents is an important contribution, the recreation expenditure of locals does not represent new money introduced into the economy. If national forest related opportunities were not present, it is likely residents would participate in other locally based recreation activities and this money would remain in the economy.

Non-local visitors, bringing new money into the area, generate approximately 66 percent of the jobs and 70 percent of the labor income from expenditures. Forest Service operations themselves are the second-largest generator of jobs and the largest generator of labor income if local recreation is excluded.

Table 10: Coronado NF Employment Contribution by Industry

Forest Economic Contribution Source	Number of Jobs Contributed		
	Total Forest Contribution	Estimated Contribution of the Recreation Activities of Local Residents	Amount of Forest Contribution that Represents the Introduction of New Money into the Local Economy
Agriculture	64	6	58
Mining	0	0	0
Utilities	3	1	2
Construction	16	2	14
Manufacturing	41	22	19
Wholesale Trade	61	32	29
Transportation and Warehousing	42	14	28
Retail Trade	244	106	138
Information	14	5	9
Finance and Insurance	21	6	15
Real Estate, Rental and Leasing	56	17	39
Professional Scientific, and Technical Services	102	15	87
Management .of Companies	6	3	3
Administration, Waste Management, and Removal Service	43	14	29
Educational Services	8	2	6
Health Care and Social Assistance	86	25	61
Arts, Entertainment, and Recreation	80	38	42
Accommodation and Food Services	545	217	328
Other Services	69	23	46
Government	377	85	292
Total Forest Management	1,878	633	1,245
Percent of Total	100%	34%	66%

Source: IMPLAN

Table 10 shows the Coronado NF's contribution to employment by sector. Forest Service activities generated the most jobs in the accommodations and food sector, followed by government, and retail trade. These numbers are consistent with national forest lands that are primarily utilized for recreation and wildlife viewing. Timber and grazing activities are associated with jobs generated in the agriculture and manufacturing sectors.

Table 11: Coronado NF Labor Income Contribution by Industry

Forest Economic Contribution Source	Thousands of 2006 Dollars		
	Total Forest Contribution ($)	Estimated Contribution of the Recreation Activities of Local Residents ($)	Amount of Forest Contribution that Represents the Introduction of New Money into the Local Economy ($)
Agriculture	842.2	144.5	697.7
Mining	2.4	0.7	1.7
Utilities	258.3	86.7	171.6
Construction	631.7	91.0	540.7
Manufacturing	2,384.1	1,367.4	1,016.7
Wholesale Trade	2,851.4	1,517.1	1,334.3
Transportation and Warehousing	1,875.6	678.3	1,197.3
Retail Trade	5,868.0	2,561.0	3,307.0
Information	641.8	238.0	403.8
Finance and Insurance	1,069.6	331.9	737.7
Real Estate: Rental and Leasing	1,004.4	293.1	711.3
Professional, Scientific, and Technical Services	2,833.4	570.7	2,262.7
Management of Companies	231.5	99.1	132.4
Administration, Waste Management, and Removal Service	1,081.5	346.6	734.9
Educational Services	164.5	51.9	112.6
Health Care and Social Assistance	3,419.3	984.6	2,434.7
Arts, Entertainment, and Recreation	1,458.0	700.7	757.3
Accommodation and Food Services	9,015.3	3,335.6	5,679.7
Other Services	1,462.0	439.2	1,022.8
Government	24,057.5	4,255.6	19,801.9
Total Forest Management	61,152.8	18,093.8	43,059.0
Percent of Total	100%	30%	70%

Source: IMPLAN

The estimates of labor income generated by sectors (Table 11) are similar to the results for jobs. However, the largest amount of labor income is generated in the government sector, followed by the accommodation and food services, and retail trade sectors.

Table 12 shows the estimated employment and labor income generated by activities on the Coronado NF relative to the regional economy as a whole. Currently the largest single industry is government, which includes public education and civil servants. This is followed by the retail trade, health care and social assistance, and accommodation and food services sectors. The government sector produces a higher proportion of labor income relative to employment indicating higher-paying jobs.

Coronado NF activities are estimated to be responsible for 0.3 percent of jobs and labor income within the regional economy. The sector that is most dependent on the contributions of the Coronado NF is accommodation and food services which account for 1.2 percent of the jobs in this sector and 1.3 percent of the labor income. Contribution to all other sectors is less than 1 percent.

Because of the large size of the analysis area, the contribution of the Coronado NF appears quite small in the regional economy as a whole. The large and diverse economy of Pima County, Arizona tends to dilute the effects of locally important industries. The Coronado NF's contribution to the economies of the small rural

communities in the analysis area would certainly be larger. Because it is not possible to attribute Forest outputs to each county, it is not possible to analyze the county-by-county contributions to jobs and labor income. However, to provide some insight as to the importance of Forest-related industries in the smaller communities of the study area, the economies of each county in the analysis area are described in Appendix A.

Table 12: Current Role of Coronado NF Related Contributions to the Area Economy

Industry	Employment (Jobs)		Labor Income (Thousands of 2006 Dollars)	
	Area Totals	CNF Related	Area Totals	CNF Related
Agriculture	7,811	64	220,702.3	842.2
Mining	2,957	0	166,041.5	2.4
Utilities	2,274	3	182,345.3	258.3
Construction	37,935	16	1,472,877.6	631.7
Manufacturing	36,712	41	2,519,168.8	2,384.1
Wholesale Trade	11,175	61	526,470.9	2,851.4
Transportation and Warehousing	13,113	42	664,988.0	1,875.6
Retail Trade	62,895	244	1,618,354.9	5,868.0
Information	9,684	14	511,909.8	641.8
Finance and Insurance	12,282	21	593,117.1	1,069.6
Real Estate: Rental and Leasing	25,681	56	445,633.2	1,004.4
Professional, Scientific, and Technical Services	28,292	102	1,382,811.7	2,833.4
Management of Companies	2,851	6	105,262.0	231.5
Administration, Waste Management and Removal Service	34,468	43	890,056.4	1,081.5
Educational Services	4,798	8	104,636.8	164.5
Health Care and Social Assistance	55,647	86	2,124,791.7	3,419.3
Arts, Entertainment, and Recreation	11,272	80	157,466.8	1,458.0
Accommodation and Food Services	43,928	545	696,264.0	9,015.3
Other Services	36,904	69	761,096.0	1,462.0
Government	117,429	377	5,842,772.9	24,057.5
Total Forest Management	558,106	1,878	20,986,767.8	61,152.8
Percent of Total	100.0	0.3	100.0	0.3

Sustainability Discussion: Demographic and Economic

In the early stages of Arizona's development, industries such as mining, ranching, farming, and timber harvesting were the mainstays of local economies. For decades, these sectors provided the foundation for employment upon which the state's predominantly rural economy was based (Case and Alward 1997, Rasker 2000). In recent decades, however, Arizona has joined neighboring western states in experiencing a significant decline in these industries along with the employment and income they traditionally provided (Baden and Snow 1997, Booth 2002).

These trends are not wholly supported by information specific to the area surrounding the Coronado NF. Mining activity has recently increased, reflecting a strong market for metals and other minerals. Although there are currently no large mines operating on the Coronado NF, several proposals are being processed.

Livestock grazing continues to be an important economic activity on the Coronado NF, and one that is largely dependent on availability of National Forest Lands as a forage base. Most area ranches are made up of combinations of private, state, and federal (Forest Service and Bureau of Land Management) lands. While the number of grazing permittees has remained stable since 2001, the number of cattle permitted to graze is decreasing due to permit adjustments. Continued declines could have implications for the industry as a whole. Socially, a critical mass of ranches is needed to support the infrastructure, markets, and human relationships that keep ranch culture and industry alive (Brunson and Huntsinger 2008). The future of this industry may lie in conservation ranching, carbon sequestration, and emerging demands for grassfed beef and locally produced food (see Production Uses and Sustainability Discussion: Land Ownership, Uses, Access, and Special Areas).

While shifts away from commodity based economies have undoubtedly had negative impacts on many local economies, the relative expansion of information- and service-based industries has led to a more diverse, and some say more sustainable, state economy (Baden and Snow 1997, Booth 2002). The economic data gathered for the area of assessment for Coronado NF illustrate this trend, showing substantial growth in finance, insurance, and real estate, services, and construction industries. When matched with a simultaneous decline in mining and agriculture, these changes have made the composition of the area's rural economy similar to those of urban areas and the State of Arizona as a whole (Booth 2002, Case and Alward 1997).

These changes are similar to those seen in recent decades throughout the Mountain West and signal important demographic and economic trends that are likely to shape the region's future development. Despite relatively slow economic growth for the area surrounding Coronado NF, data show expansion of certain populations and industries that are increasingly important to the local economy. In particular, the increase in retirement-aged population and seasonal housing units, when combined with increases in the service/professional, retail trade, and construction industries, mirrors a common trend in rural western economies. This trend takes on more relevance when combined with observed demographic trends showing an influx of retirement-age residents and seasonal homeowners. Several researchers have noted that while labor income is growing in the rural Mountain West, it is growing more slowly than transfer (social security, pensions, and retirement) and dividend income. However, even with the influx of transfer and dividend income, the per capita and median income in the counties surrounding the Coronado NF are lower than state averages. The urban counties; Pima, Pinal and Cochise had higher income and lower poverty rates than the rural counties.

For the Coronado NF, an older population may indicate an increasing need for easily accessible recreation opportunities. Increases in seasonal housing indicate that people are moving to the area for leisure. Amenity values, such as scenery and the recreation settings provided by National Forest Lands, are likely important to decisions for location of retirement and seasonal housing. At the same time, the relatively low income level of most residents indicates that providing access to low cost, local recreation opportunities on National Forest lands is important.

Taken altogether, these trends signal a convergence of rural and urban economies that carries important implications for natural resource management. Illustrating this convergence is recent political activity in

Pima and Santa Cruz Counties, Arizona opposing proposals for new mines because of potential harmful impacts to natural resources. Conversely, Graham County, Arizona is experiencing considerable economic growth associated with construction of a new mine near the City of Safford. Several proposed mines are either located on, or dependent on the use of Coronado NF lands. These proposals are generating a high level of controversy, reflecting a general passion in the surrounding communities for preserving the natural landscapes of the Coronado NF.

Finally, data for the area surrounding the Coronado NF demonstrate the reciprocal cause-and-effect relationships between economic and demographic trends. Although economic growth of the communities around the Coronado NF may be fueled by households choosing to locate in the area because of the amenities provided by natural settings, potentially negative consequences include an increased demand for construction, schools, health care, and other services, as well as undesirable side affects such as pollution, urban sprawl, congestion (Rasker 2000, Case and Alward 1997) and the negative effects of exurban development on native species (Lenth et al. 2006, Hansen et al. 2005). In other words, people that are moving to the area to enjoy the natural amenities may actually be diminishing those values. Two major effects of ex-urban development to the Coronado NF are increasing difficulty in sustaining organisms and processes across landscapes, and increased difficulty in providing access to National Forest Lands (see Sustainability Discussion: Land Uses, Land Ownership and Special Areas).

Land Use, Users, Access and Special Areas

Land Ownership and Land Use

As a whole, land ownership within the area of assessment differs from overall ownership patterns for the State of Arizona in that it involves relatively large amounts of private acreage and State Trust land, both of which are likely to have a considerable impact on future development patterns throughout the region. Hidalgo County, New Mexico; and Cochise and Santa Cruz Counties, Arizona reported the greatest amounts of private land as of 2005, while Pima and Graham Counties, in Arizona had the least. The percentage of State Trust land was greatest in Pinal and Cochise Counties, Arizona. Santa Cruz County, Arizona has far and away the greatest amount of National Forest System land, and Graham and Pima Counties, Arizona reported the highest percentage of land owned by Native American entities.

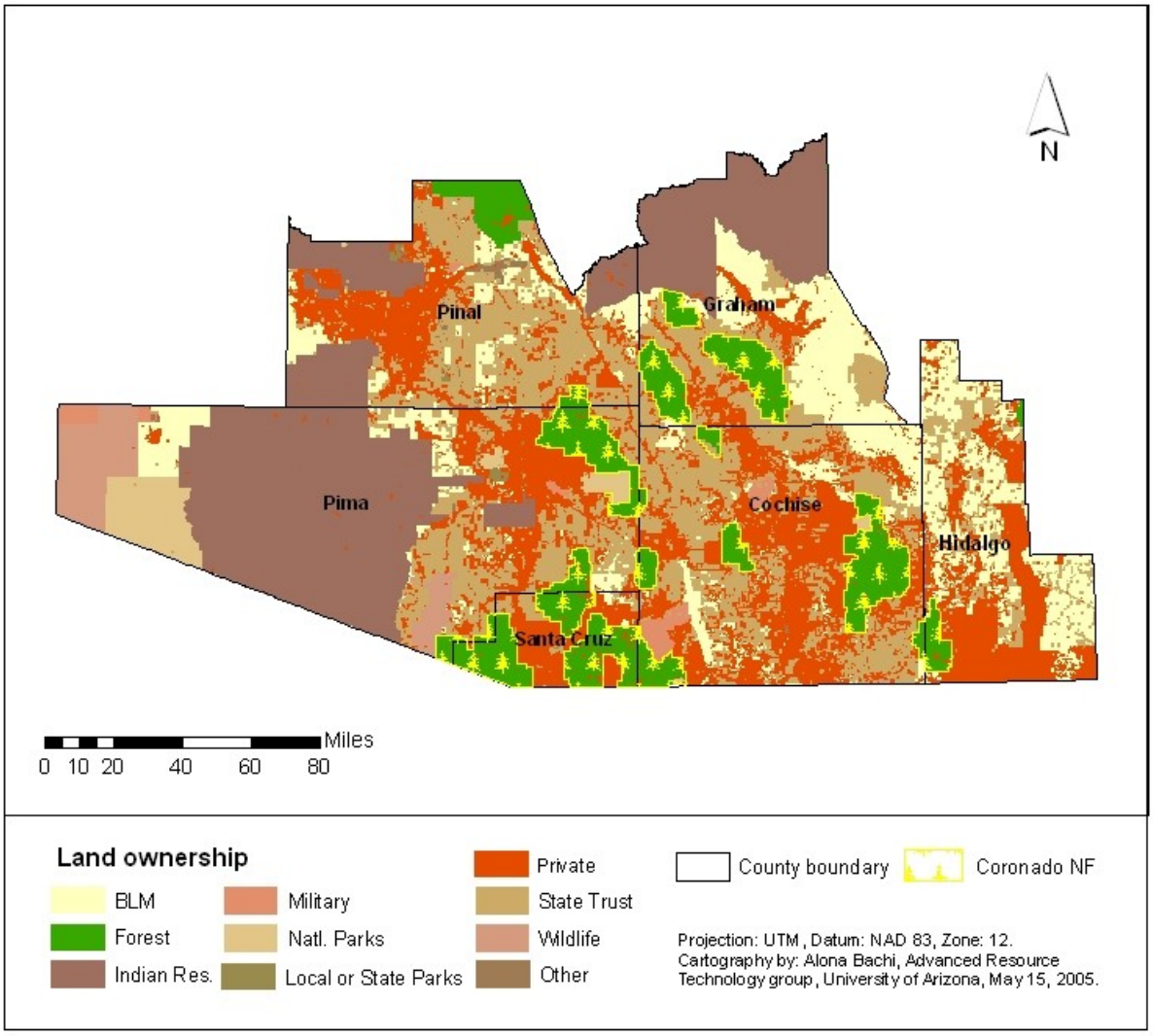


Figure 13: Land Ownership within Area of Assessment

Land Ownership Patterns

Land ownership patterns within and along the boundaries of the Coronado NF present unique challenges to management. The non-contiguous nature of the Forest results in a large proportional amount of boundary interface when compared to other national forests in Arizona. For example, the Coronado NF has 0.39 miles of boundary per square mile of Forest land (mi/mi^2), compared with 0.11 mi/mi^2 for the Coconino NF, and between 0.23 and 0.28 mi/mi^2 for the rest of the Arizona national forests. In addition, the Coronado NF shares 60 miles of international boundary with the Republic of Mexico. There are also an estimated 56,000 acres of private lands and other non-federal lands within the Coronado NF's proclaimed boundaries. Most of these lands are either patented mining claims or lands settled under homesteading laws.

Landownership patterns created by homesteading laws persist today in and around public land; private lands generally occupy small, flat, and fertile areas with natural water, surrounded by or adjacent to National Forest System land at higher elevations (Sayre 2005). Much of the homesteaded land in and around the Coronado NF is now associated with grazing allotments[8]. According to a recent survey of Coronado NF livestock grazing permittees (Conley et al. 2007), 81 respondents, representing 61 percent, collectively owned 274,276 acres of private land associated with their livestock operations. The average private land holding of respondents was 3,657 acres. Considering the number of non-respondents, it is reasonable to speculate that a significant amount of additional private land is associated with Coronado NF grazing allotments[9].

Land Adjustments and Boundary Management

The "sky islands" nature of the Coronado NF [twelve separate forest mountain range units located in 6 counties (Cochise, Graham, Hidalgo (NM), Pima, Pinal, and Santa Cruz), two states (Arizona and New Mexico), and adjacent to the International Boundary with Mexico] and interspersion of private and other non-Federal land within and adjacent to the proclaimed national forest boundary leads to the need for an intensive and extensive land adjustment and boundary management program.

Additionally, the area is experiencing rapid population growth, a wide variety of land uses, and increased development of the private land in southeastern Arizona and southwestern New Mexico. All these factors combine to make land adjustment and boundary management activities far more complex and controversial in recent years.

The current checkerboard and fragmented landownership patterns within and adjoining the Coronado NF is the result of many, often conflicting laws: Homestead Acts; General Mining Laws; Timber and Stone Act; Weeks Act; Land and Water Conservation Fund Act; and various other disposal and acquisition laws. The result is the current complicated and confusing land ownership pattern, conflicts in land uses within and adjacent to the forest boundary, encroachment on both National Forest System (NFS) and non-federal lands, the loss of traditional public access routes, and higher administrative cost.

The Forest Service may acquire lands through exchange, purchase, donation, or condemnation. Of these, land exchange has been, and will continue to be the primary method of acquisition. It should be noted, though, that land exchanges are invariably controversial and complex. Since 1986, the Coronado NF has completed 24 land exchanges. Approximately 16,600 acres of land valuable for public access, or protection of resources were acquired; and approximately 5,500 acres of National Forest System lands, those found to be more valuable for purposes other than national forest, were exchanged to other ownerships.

More than 1,000 miles of road rights-of-way (ROW) were identified during the 1986 planning process, as needed to insure adequate access for public and administrative use. Since 1986, the United States, acting

[8] In 1905, President Roosevelt's Public Lands Commission established a system of grazing allotments and permits on National Forest System lands, usually tied to adjacent titled land.

[9] Commensurate property is required to be within, adjacent to, or otherwise reasonably accessible to the grazing allotment (FSM 2231.22a).

through the Forest Service, Department of Agriculture, has acquired (without direct purchase) 57.2 miles of ROW, assisted several counties to acquire approximately 30 miles of ROW, and eliminated the need for several ROW (25 miles) on land acquired through exchange.

The Forest has approximately 1,600 miles of property boundary, not including the international boundary with Mexico, boundaries with three National Park units, a national wildlife refuge, a Military Reservation, and the San Carlos Apache Indian Reservation. This includes ± 942 miles of exterior and ± 658 miles of interior boundaries. The Forest also has approximately 700 miles of Congressionally Designated Area and 50 miles of Research Natural Area boundary. The interspersion of private lands within the National Forest and development of private lands both within and adjacent to its boundaries has also resulted in increased occupancy trespass.

Approximately 10 percent (160 miles) of the Forest's property boundaries had been posted to standard when the Forest Plan was completed in 1986. Currently, 219 miles of forest land line boundary has been posted surveyed and posted to standard, and less than 1,400 miles of property boundary needs to be surveyed and posted to standard.

Long Range Land Use Plans and Local Policy Environment

County land use within the area of assessment ranges from traditional uses such as farming and ranching in rural areas to denser concentrations of residential, industrial, and commercial uses in and around urban centers. As the population of the area grows, private lands are increasingly subject to subdivision and development.

Preservation of open space is a particularly important land use issue given both the public's desire to maintain the "rural character" of county lands and the need to accommodate rapidly growing populations and municipalities. The debate over preservation of open space has gained increased attention throughout the region as elements such as the Sonoran Desert Conservation Plan in Pima County, Arizona and the Malpai Borderlands group in Cochise County, Arizona and Hidalgo County, New Mexico draw support from diverse stakeholders. Voters in Pima County, Arizona have strongly supported bond issues for the acquisition of land or development rights in order to preserve open space. The Malpai Borderlands Group (Sayre 2005) has effectively protected 75,000 acres of private land from development through conservation easements. Participants in the Forest Plan revision process have indicated that open space values are important to them. The provision of adequate, affordable infrastructure and sufficient water supplies is also a growing concern for planners, residents, and land managers throughout the region.

Land Use and Land Ownership Trends

Hansen et al. (2005) report that low-density rural home (exurban) development is the fastest growing form of land use in the United States, and has been since 1950. This trend is mirrored in the analysis area, and has serious implications for the management of the Coronado NF. Development along the boundaries has the potential to result in further restrictions in the ability of the public to gain access to the Coronado NF. It has also been shown that exurban development has significant negative impacts on native species, and that these impacts may manifest over several decades (Hansen et al, 2005) and can extend several hundred meters beyond the developed area (Lenth et al 2006). Development of any kind severely restricts the ability of the Forest Service to use fire for ecosystem restoration purposes. Given the large amount of private and state[10] land in the analysis area, management strategies for the Coronado NF that encourage land uses compatible with open space values will be needed in order to protect native species populations. Also, integration of landownership considerations with transportation planning will help to identify rights-of-way needs and opportunities.

[10] State lands in Arizona are available for disposal, and are required by law to be sold at the highest price possible to benefit the state education system.

Access and Travel Patterns

County and state transportation plans reviewed for this assessment acknowledge that current circulation networks have been developed to fit arising needs but are inadequate for accommodating projected long-term growth. As such, these plans emphasize the need for improved planning through regional approaches linking transportation and land use. According to the State of Arizona Department of Transportation, projected demographic changes throughout the state will require "major expansions of roadway capacity and the development of transportation options and alternatives to provide acceptable levels of service on Arizona's roadways and to maintain circulation" (Arizona Department of Transportation 2004b).

Modes of Travel and Seasonal Flows

Travel by motorized vehicle is by far the most dominant mode of travel throughout the State of Arizona, a trend likely to continue given patterns of development in rural areas and the expense of developing infrastructure for alternative modes of transportation. Increase in vehicle miles traveled was greatest in Pinal County, Arizona between 1990 and 2000 – an expected result of population increases over the same period. Peak traffic flow for most of the area of assessment occurs between the months of February and April, and traffic is lowest from July to September. The exception is the Interstate 10 corridor, which reaches a peak in December. With respect to internal modes of travel, the greatest increases were reported for off-highway vehicles. The topic of off-highway vehicle management has been a prominent one in the collaborative process for Forest Plan revision to date, reflecting desires for increased enforcement of rules for off-highway vehicle use, support and opposition to off-highway vehicle use, and concerns about effects on user experiences and natural resources.

Planned Improvements

The State of Arizona Department of Transportation currently has plans for a number of road improvements in proximity to the Coronado NF over the next 5 years, most of which entail road widening and resurfacing. Similarly, county governments throughout the area of assessment envision improvements to arterial road networks to accommodate expected population growth. These improvements are expected to make travel to the Coronado NF easier for automobiles, although only if they occur on routes with established access.

The Coronado NF is currently analyzing its internal road network through a Travel Analysis Process. This process will lead to proposals for modifications (closures or additions) to the network. In addition, the Forest will be implementing the Travel Management Rule by September 2009. This will result in designation of official motorized travel routes based on class of vehicles and season of use allowed on those routes, and identification of areas where dispersed camping is allowed.

Barriers to Access

The Coronado NF may have the most significant set of public access problems of any National Forest in the Southwestern Region and quite possibly the nation. Permanent legal public access to the Coroando NF is becoming increasingly restricted as traditional access routes through interior and adjacent private and State Trust lands are gated and locked.

As part of the 1986 planning process, more than 1,000 miles of road rights-of-way (ROW) were identified as needed to ensure adequate access for public and administrative use. Since 1986, the United States, acting through the Forest Service, Department of Agriculture, has acquired (without direct purchase) 32 ROW, totaling approximately 57.2 miles, assisted several counties to acquire approximately 30 miles of ROW, and eliminated the need for several ROW (25 miles) on land acquired through exchange. Although some

progress has been made, the issue has become more complicated and therefore updated management direction is needed.

The rapid growth of Arizona's and New Mexico's population has led to a much greater need for public access to National Forest System (NFS) lands. At the same time, growth has led to increased development to interior and adjacent private lands, resulting in more restricted public and administrative access. The "Sky Islands" nature of the Coronado NF also contributes greatly to the Forest's access problem. Public roads (County and State Highways) generally pass between the twelve (12) separate forest mountain range units located in 6 counties (Cochise, Graham, Hidalgo (NM), Pima, Pinal, and Santa Cruz) and two states (Arizona and New Mexico) with private and state trust lands between public roads and the NFS lands, most often leaving the National Forest mountain range units without permanent public legal access.

Less than 100 of approximately 300 public and administrative access points to the Coronado NF's ± 1.8 million acres from outside the proclaimed National Forest boundary (where most of the Coronado NF public access needs are located) have documented ROW. There is no documented permanent legal access ROW (written title) to the Galiuro, Peloncillo, Santa Teresa, or Winchester Mountains and very limited documented permanent legal access (Dragoons, Pinaleno, Tumacacori, and Whetstone Mountains).

In addition to the numerous NFS roads without documented ROW, there are also many county-maintained roads essential to getting public land users to the Coronado NF and the forest transportation system as well as adjacent state trust and other public lands that have no documented ROW. An increasing numbers of county-maintained roads (where ROW may or may not exist) long thought to be public roads have been blocked, gated, and locked or have had private landowners threatening to block, gate and lock them.

A single landowner, with a minimal amount of private land (5 acres or less) can challenge a road's ownership status, close the road to public use, and block or control access to thousands of acres of public (BLM and NFS) and state trust lands. Once one traditional access point in an area is gated and locked, neighboring access points become vulnerable to road closures by the adjoining landowners. As public land users multiply and squeeze through the remaining access points, there is a domino effect of more locked gates further restricting public access. As traditional access points and routes are lost, NFS lands essentially become "National Forest Backyards" for adjoining landowners and their guests, providing little benefit to the general public.

Landowners may be hesitant to grant ROW for perpetual public access across their private lands for a variety of reasons including impacts from off-highway vehicle use and undocumented aliens, litter and vandalism, privacy issues, potential liability, and in some cases a desire for exclusive use and control of the adjoining public lands. Counties may be reluctant to enter the legal arena to assert any ownership interest to closed roads or exercise their power of eminent domain to restore historical access.

Public access issues are often very complex and are not easily resolved, particularly when dealing with differing opinions from multiple users and public. A range of concerns have been expressed by the public during the current planning effort including: ROW issues, the ability to use forest trails, roads, and facilities, exclusive private access and control, damage and liability issues for private landowners, as well as considerations to restrict vehicular access in some areas.

Forest Users and Uses

National Forest System lands are managed for a variety of uses. The practical doctrine of managing for multiple uses, formally expressed in the 1960 Multiple-Use Sustained-Yield Act (MUSYA) (PL 86-517), developed out of conflict and cooperation among competing users and user groups. According to MUSYA, National Forest System lands are to be used in the ways that best meet the needs of the American people. Fedkiw (1998) describes managing for multiple uses as, *"the fitting of multiple uses into ecosystems according to their capability to support the uses compatibly with existing uses…in ways that would sustain the uses, outputs, services, and benefits, and forest resources and ecosystems for future generations."* From

this perspective, Forest users and uses are seen as the primary drivers of management. In general, uses are allowed unless prohibited by law, regulation, or policy; or if the use would result in substantial and permanent impairment of the productivity of the land or renewable resources; or, if the use is incompatible with the desired conditions for the relevant portion of the plan area (Forest Service Handbook 1909.12 Chapter 10 Section 11.14).

Traditional Uses

The lands that now make up the Coronado NF have provided resources for native (aboriginal) inhabitants of the area since pre-historic times. Tribal members are still interested in collecting medicinal plants, traditional basketry materials, wood for ceremonies, and other resources from Coronado NF lands. Some areas, such as the Pinaleño Mountains for Western Apache tribes hold special spiritual significance, and visits to the mountain are integral to maintaining tribal traditions and religion.

Production Uses

Historically, mining and livestock production played a major role in public land management throughout the area of assessment. National studies show that land uses such as livestock grazing, timber cutting, and mining are being slowly succeeded in policy and management by an emphasis on recreational uses. These national trends are not wholly supported by information specific to the Coronado NF. Commercial mining activity has increased recently, reflecting a strong market for metals and other minerals. At the same time, the Coronado NF is pursuing the withdrawal of several areas from mineral entry in order to protect and preserve their natural resource values and integrity.

While the number of grazing permittees has remained stable since 2001, the number of cattle permitted to graze is decreasing due to permit adjustments. On one hand, increased awareness of the ecological services provided by ranch lands may influence this whole sector in the future by redefining the "production" of ranch lands to include more than beef cattle; for example to include open space and wildlife values. These values are increasingly being capitalized through the sale of conservation easements and other transfers of development rights. On the other hand, if grazing access to the Coronado NF is curtailed such that ranching is not a viable land use in the area, those other values may suffer considerably[11].

Recreational Uses

Although recreational use has increased steadily since the establishment of the Coronado NF, the increase in recreation over the past few decades has been particularly dramatic. According to National Visitor Use Monitoring data, the Coronado NF received over 2 million visits during fiscal year 2001 – the majority of which were male, white, and between the ages of 31 and 70. Spanish, Latino, or Hispanic visitors made up approximately 7.9 percent. Nearly 3 percent of visitors were from a foreign country. The most frequently reported zip codes indicate that most visitors were from the Tucson metro area, including nearby communities such as Green Valley and Oro Valley.

The five most popular activities for visitors to the Coronado NF were viewing natural features (63.2 percent participation), hiking or walking (50.9 percent participation), general relaxing (36.8 percent participation), viewing wildlife (36.4 percent participation) and driving for pleasure (24.3 percent participation). Visiting nature centers, nature trails, and other interpretive information services, as well as camping and picnicking at developed sites, were also very popular (Kocis et al. 2002b).

[11] Conservation easements in the area are sometimes tied to the ability of the landowner to have access to Forest Service or other public land grazing permits. If access is denied due to causes outside of the landowner's control, the easement is null and void.

The Coronado NF includes facilities for a variety of recreational activities, including camping and hiking, hunting and fishing, wildlife viewing, boating, skiing, rock climbing and caving. The Coronado NF contains several lakes that are stocked by the State of Arizona Game and Fish Department, designated mountain bike trails, designated motorized touring areas, and a privately operated ski area (USFS 2005p). The Sabino Canyon Recreation area, located adjacent to Tucson, includes a shuttle tour service, picnic areas, and interpretive facilities. It currently receives more than one million visitors annually.

The Coronado NF instituted a policy of collecting fees at high recreational use areas after Congress approved the Recreation Fee Demonstration Program (PL 104-134) in 1996, and continues to do so under the 2004 Federal Lands Recreation Enhancement Act (PL 108-447, Section 804). Currently, fees are collected in high impact recreation areas, which are those areas that support concentrated recreation use. Each site or area must contain six "amenities," which are picnic tables, trash receptacles, toilet, parking, interpretive signing and security. Fees are currently collected at sites in the Santa Catalina Mountains, Madera Canyon in the Santa Rita Mountains, and South Fork-Cave Creek in the Chiricahua Mountains (USFS 2008).

The Coronado NF has identified the significant increase in off-highway vehicle activity as a major component of unmanaged recreational use (USFS 2008). In 2004, the Forest Service proposed a new Rule (regulation) to help manage off-highway vehicle recreation in national forests. This Rule is now being implemented on the Coronado NF through an analysis of the Forest's road system, and by 2009 is expected to identify a system of roads and areas open for specified motorized uses. Motorized vehicles will be prohibited in any areas not specifically identified in this process.

Motorized use off of roads is currently prohibited on the Coronado NF, although there is an allowance for pulling off of established roads for up to 300 feet for camping or game retrieval purposes. Due to the lack of clarity as to where established roads are, this policy has led to enlargement of areas disturbed by motor vehicles. In addition, the issue of vehicle noise is becoming more prominent as vehicular use in general increases on the Coronado NF. Recreational vehicles, such as All Terrain Vehicles (ATVs) are often noisy, and disturb other recreational users as well as wildlife (USFS 2008).

Illegal Uses

Participants in the public collaboration process for Forest Plan revision to date describe a changing social environment affected by illegal immigration, urbanization, and regional population growth. In the Coronado NF, undocumented immigrants are the most common type of "illegal users". The region has seen a dramatic increase in the migration of undocumented immigrants since 1994, with particularly large numbers of crossings and apprehensions in the Nogales, Sierra Vista, and Douglas Ranger Districts. Drug smuggling activity also occurs on a large scale in these areas. The primary impacts to Coronado NF are a tremendous amount of garbage and human waste left on the Forest, and serious human safety concerns for employees and visitors as the level of violence associated with illegal immigration and drug smuggling increases. A significant number of wildfires in the border ranger districts are caused by people engaged in illegal activities. Forest Service firefighting efforts are greatly complicated by the very real possibility of encounters with armed and violent groups or individuals in these areas.

Vandalism to natural and cultural resources continues to be a problem associated with users that are either unaware of, or uncaring about the effects of their actions. Deliberate destruction of heritage sites by pot hunters is a problem that results in irreplaceable losses of cultural resources. Public comments generally indicate an assessment of changes in user values and a perceived decline in land ethics that is affecting Forest resources and experiences. Participants expressed a desire for increased attention to public safety and rule violations by a combination of user education efforts and increased law enforcement.

Designated Areas and Special Places

Officially Designated Areas

There are currently 21 officially designated special areas, including six Research Natural Areas (RNA), three proposed RNAs, one area managed with an emphasis on manipulative research, eight Wilderness Areas, three Wilderness Study Areas (WSA), and two Zoological Botanical Areas. There are also 16 segments of stream courses that have been identified as eligible for consideration for Wild and Scenic River designation. Recommendations reflected in the current forest plan (circa 1986) are that one of the three Wilderness Study Areas (Mt. Graham WSA) should be formally designated as a Wilderness, and that two of the three (Bunk Robinson WSA and Whitmire Canyon WSA) should not be formally designated as Wildernesses, and therefore should be un-designated as WSAs. These recommendations were never taken through the legislative processes required to establish the Mt. Graham Wilderness Area, or un-designate the Bunk Robinson and Whitmire Canyon WSAs. Therefore, all three areas are still WSAs. Many other areas and places have some form of designation, and a complete list is presented in Appendix B.

Natural, Cultural, Recreational, and Interpretive Resources

The Coronado NF encompasses considerable natural, recreational, cultural, and interpretive resources, including over 400 dispersed recreation sites, campgrounds, picnic areas, and scenic areas. The value to surrounding communities of the recreational resources available on the Coronado NF cannot be overstated. Special places are sometimes associated with certain times of the year. For Mexican citizens, large family gatherings in certain Coronado NF camping areas are especially important on Easter and Mother's Day.

Although special places are inherently difficult to identify and categorize, the Coronado NF is home to a number of identifiable places considered special by various groups and individuals. There are various geographic, cultural and landscape feature attributes associated with the perception of special places (Eisenhaur, Krannich, and Blahna 2000). Some areas, such as the Pinaleño Mountains for Western Apache tribes, hold special spiritual significance, and visits to the mountains are integral to maintaining tribal traditions and religion.

Some attributes become more noteworthy, and therefore perhaps more "special", when there is a perception that they have been diminished. Within the Coronado NF, there is concern that two attributes in particular, scenery and quiet areas, are diminishing as more development occurs and more people visit the Forest (Russell 2008). Incorporating scenic objective values, as enumerated within the Scenery Management System, into a revised Forest Plan will be an important strategy to manage these values in the future. Strategies to preserve the opportunities for quiet recreation will need to evolve.

Sustainability Discussion: Land Ownership, Uses, Access, and Special Areas

The area surrounding the Coronado NF exemplifies many of the trends and controversial issues involving economic stability, effective management of, and access to public lands. At issue is how, and whether, private owners and public land managers can come to an agreement on how to best manage the competing priorities of resource conservation and economic development. As seen in the county comprehensive plans reviewed for this assessment, planners are struggling to cope with growing demands for housing, recreation, and water supplies while ensuring preservation of a shrinking natural resource base that contributes to Arizona's highly valued rural character and open space.

Conversion of private parcels from farming and ranching to more urban land uses has outpaced population growth over the last several decades (USFS 2005f). In the assessment area, this shift has been especially dramatic in Pinal County. Meanwhile, there is increasing awareness of the important role of Arizona's State Trust lands in conserving natural resources and sustaining urban growth. Access to National Forest grazing lands is likely key to sustaining ranching on private and State Trust lands in southeastern Arizona and

Hidalgo County, New Mexico. Given the relatively high percentage of these lands in proximity to the Coronado NF, future uses will be highly relevant to Forest management.

Because of the “sky island” configuration of the Coronado NF, landownership patterns are intrinsically tied to road and trail access to the Forest. Permanent legal public access to the Coronado NF has become increasingly restricted as traditional access routes through interior and adjacent private and State Trust lands are gated and locked. A landowner with a minimal amount of private land has the ability to block or control access to thousands of acres of National Forest System land. In some cases, adjacent lands have become national forest “private back yards” for landowners and their guests, providing no benefit to the general public. While it is a landowner’s right to deny public access, it is the responsibility of state and federal agencies to provide reasonable access to public lands. Comprehensive, coordinated, and collaborative efforts will be central to resolving the Forest’s public access needs.

As the area around the Coronado NF becomes increasingly urbanized and populations more diverse, there is an increasing demand for a wider variety of recreational uses within the Coronado NF (USFS 2008). Under these conditions and in the face of declining budgets, simply maintaining services and facilities has become a challenge. The Recreation Fee Program is key to providing services on the Coronado NF; however, this program is not without controversy. Implementation of the Travel Management Rule and the upcoming Recreation Facilities Analysis will present opportunities for resolving recreational user conflicts and providing for sustainable recreation experiences. The need to preserve opportunities for quiet recreational experiences and to protect scenery resources should be considered in these processes.

Finally, there is a growing recognition that identification of special places is important because people, in today’s world of homogenization, seek unique and special qualities in their public lands (Williams and Stewart 1998

Community Relationships

A review of state and local newspapers reveals a continued local interest in the use and management of the natural and cultural resources of the Coronado NF, and particularly intense concern surrounding fire control and prevention, illegal activity along the U.S.-Mexico international border, and management of wildlife and regional water supplies.

Community Involvement with Natural and Cultural Resources

The communities surrounding the Coronado NF have long been dependent upon its natural resources for commodity production, tourism, traditional use, and aesthetic enjoyment. In return, these communities have responded with major contributions of time, money, and energy in the form of formal partnerships or informal volunteer projects. In 2005, a conservative estimate for the value of volunteer hours on four of the five ranger districts was $551,851. Fundraising efforts by partners are significant, yielding about $20,000 per year in cash contributions and usually more from in-kind contributions, such as materials donated in group volunteer projects. In 2007, concerned Tucson donors raised $800,000 in private funds to help restore the Sabino Canyon Recreation Area, which was badly damaged by flooding and debris flows during 2006 monsoonal storms. Other partners known as “cooperators” contributed $147,000 in 2005 and $448,000 in 2006 to projects that had mutual benefit to the Forest and the contributor. Examples of these cooperators are: the Natural Resource Conservation Service, Quail Unlimited, the National Wild Turkey Federation, Fort Huachuca (military), and the USDI National Park Service and Bureau of Land Management.

International Border

The international border with the Republic of Mexico is an important social and cultural feature, as it influences a range of Coronado NF resources and uses, management issues, and interactions with other land management and law enforcement agencies. There are a significant number of Mexican citizens that regularly come to the Coronado NF to recreate. The cross-border sharing of resource management knowledge and experience, especially in the fields of fire ecology, wildlife studies and range management, archeology, and historic preservation has been facilitated by the International Forestry program since the early 1990’s. More recently, coordination of management with the Department of Homeland Security has become a high priority for the Coronado NF, in law enforcement issues as well as fire fighting and road maintenance. A major challenge is balancing the need for law enforcement activities with the need to limit ground disturbing activities, for example off road travel of law enforcement vehicles. Also, infrastructure needed for law enforcement activities, for example observation towers, will likely affect the scenic resources of the forest.

Communities of Interest and Historically Underserved Communities

The management activities of the Coronado NF should take into account the interests of a growing number of community groups and Forest partners. Organizations and individuals influencing forest planning and management represent government agencies, tribes, special advocacy groups, business interests, educational institutions, and the media. While attending to the issues and concerns of these active interest groups, the Forest Service also is making a concerted effort to address the needs and desires of historically underserved communities, a fact that is increasingly important to the Coronado NF given the increasing social and cultural diversity of the region’s communities and populations.

Tribal Relations

There are 12 federally recognized tribes with a potential interest in the natural, historical, cultural, and other resources of the Coronado NF including Ak-Chin Indian Community, Fort McDowell Mohave-Apache Indian Community, Fort Sill Chiricahua-Warm Springs Apache Tribe, Gila River Indian Community, Hopi Tribe, Mescalero Apache Tribe, Pascua Yaqui Tribe, Salt River Pima-Maricopa Indian Community, San

Carlos Apache Tribe, Tohono O'odham Nation, White Mountain Apache Tribe, Yavapai-Apache Nation, and the Pueblo of Zuni.

Native American tribes have a unique status in their relationship to the land managed by the Federal Government. In recognition of this unique status, consultation with tribes in the land management planning process is required under the 2008 Planning Rule (36 CFR 219.2.1(3)). The Coronado NF has initiated this consultation. A forum convened with tribes in 2004 indicated desires for more accommodation of traditional uses and cultural uses in decision making and planning, clarification of the role of cultural and other non-economic values in decision-making about such issues as Mount Graham, the incorporation of traditional knowledge in management and planning, attention to site protection and privacy issues in the management of cultural resources, and a desire for cooperative management of resources of mutual interest to tribes and the Forest Service.

Sustainability Discussion: Community Relationships

Social and cultural studies of communities in the analysis area suggest increasing complexity and diversity including complimentary and sometimes conflicting interests in Coronado NF lands and resources. Similarly, local and national groups provide input and express interest in the specifics of forest management and planning. The intensity and diversity of interests in Coronado NF issues suggests the continued importance of attention to the relationship of the Coronado NF with communities of place and communities of interest in this social environment. The nature of this environment also implies a need for ongoing consideration of the types of users and uses, values about forest lands and resources, socioeconomic interactions between communities and forest lands and resources, as well as the quality of working relationships between the Forest Service, its partners, and other interested parties. Future forest management and planning will benefit from incorporating existing frameworks and approaches to enhance community-forest relationships (Pacific Northwest Research Station, 2003). These frameworks will help the Forest Service develop a comprehensive strategy to develop an understanding for community relations, and for monitoring and enhancing these relationships.

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Appendix A: Economic Descriptions by County

The following pages provide a series of charts depicting the economy within each county in the analysis area. This analysis will display the differences between the counties and the relative importance of natural resource industries to each.

Cochise County, Arizona

IMPLAN data was used to examine the overall economic activity, including natural-resource dependent economic activities within the county.

Figure A1 displays the relative size of the labor income produced in the natural resource related sectors to the countywide economy in 2002. Forest related sectors represented only 2 percent of the labor income in the Cochise County economy. Figure A2 shows that natural resource related employment represented 6 percent of county employment in 2002. Tourism was the largest natural resource related sector at 3.8 percent of employment and 1.7 percent of labor income. Grazing produced 0.1 percent of labor income, and had 2.1% of the County's employment.

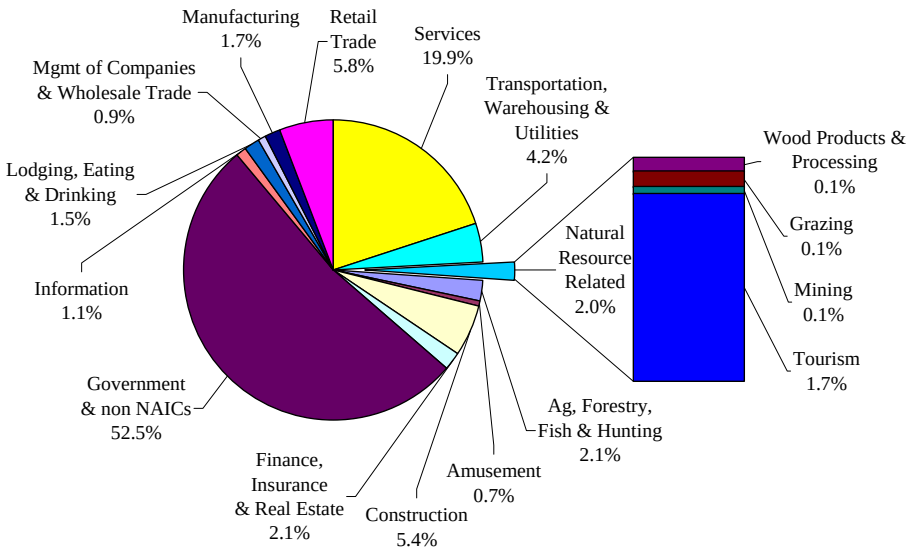

Figure A1: Cochise County, Arizona 2002 Labor Income (IMPLAN)

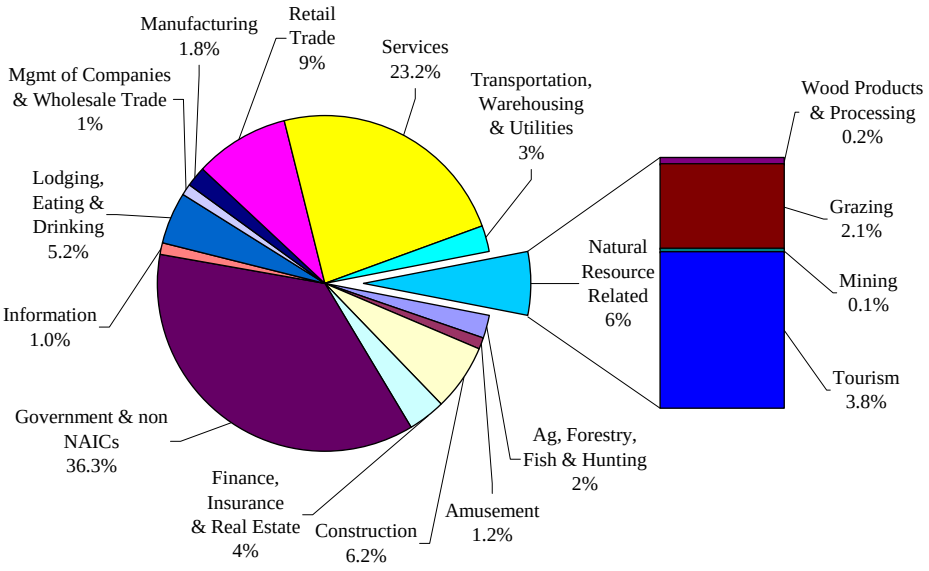

Figure A2: Cochise County, Arizona 2002 Employment (IMPLAN)

Graham County, Arizona

Figure A3 displays the relative size of the labor income produced in the natural resource related sectors to the county-wide economy in 2002. Forest related sectors represented only 3 percent of the labor income in the Graham County economy. Within that, tourism was the largest sector. Figure A4 shows that natural resource related employment represented 7.3 percent of county employment in 2002. Tourism was the largest natural resource related employer with 4.6 percent of employment, but only 2.4 percent of labor income. The grazing sector produced 0.1 percent of labor income and 2.6 percent of employment.

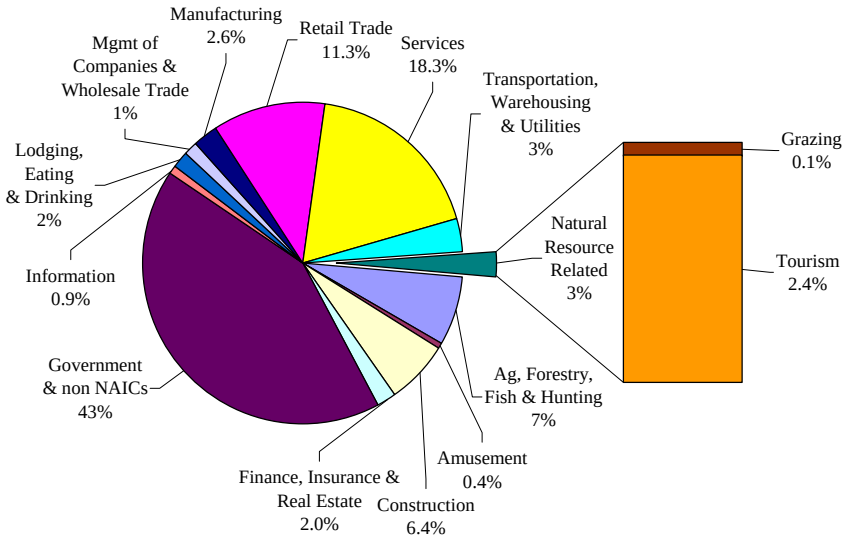

Figure A3: Graham County, Arizona 2002 Labor Income (IMPLAN)

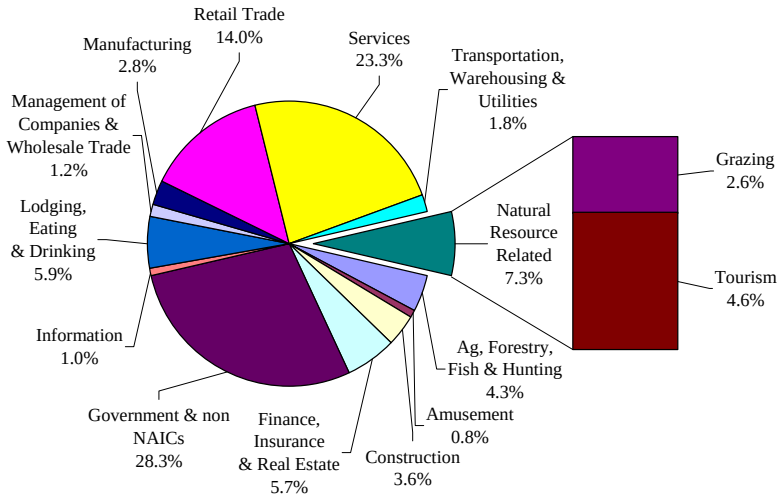

Figure A4: Graham County, Arizona 2002 Employment (IMPLAN)

Hidalgo County, New Mexico

Figure A5 displays the relative size of the labor income produced in the natural resource related sectors to the county-wide economy in 2002. Forest related sectors represented 7.6 percent of the labor income in the Hidalgo County economy. Within that, tourism was the largest sector. Figure A6 shows that natural resource related employment represented 17.1 percent of county employment in 2002. Tourism produced 4.9 percent of labor income and 7.7 percent of employment. The grazing sector produced 2.6 percent of labor income; and had 9.2 percent of employment.

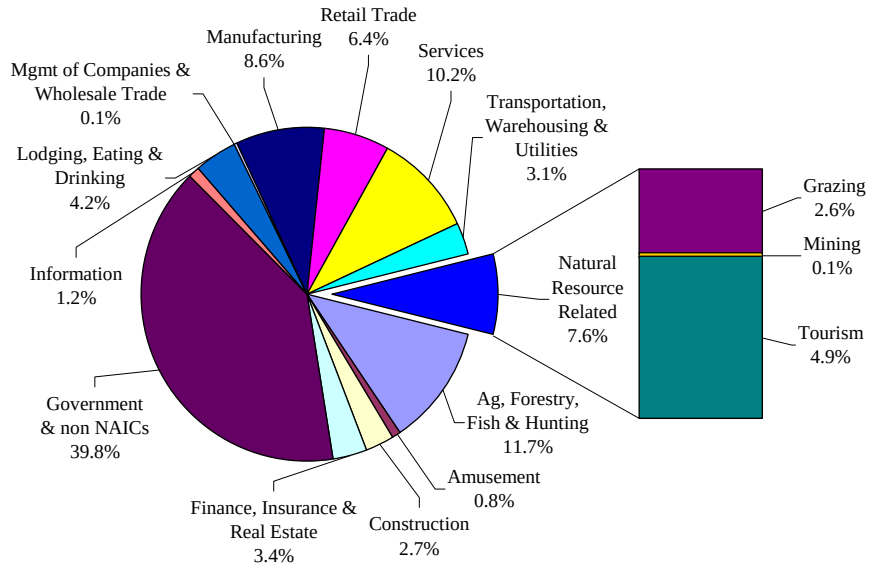

Figure A5: Hidalgo County, Arizona 2002 Labor Income (IMPLAN)

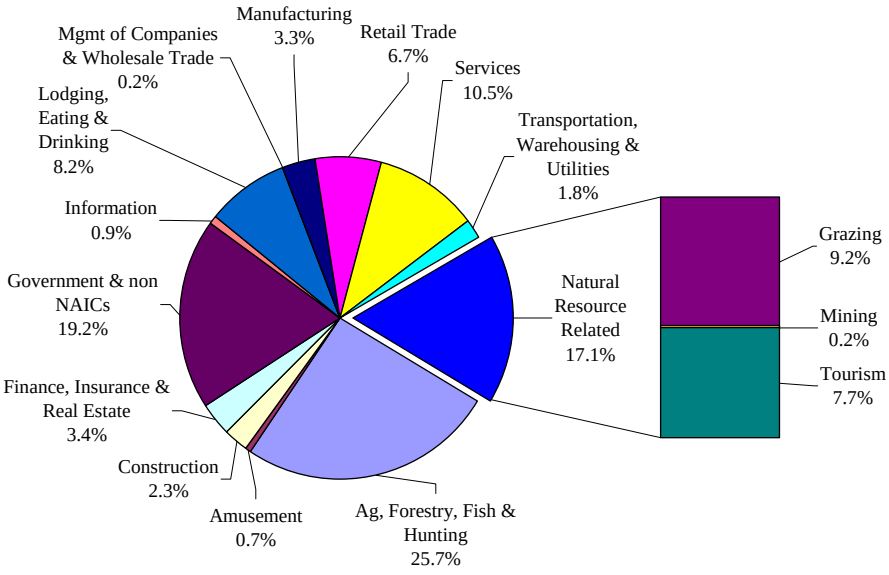

Figure A6: Hidalgo County, Arizona 2002 Employment (IMPLAN)

Pima County, Arizona

Figure A7 displays the relative size of the labor income produced in the natural resource related sectors to the county-wide economy in 2002. Forest related sectors represented only 3.4 percent of the labor income in the Pima County economy. Within that, tourism was the largest sector. Figure A8 shows that natural resource related employment represented 7.3 percent of county employment in 2002. While tourism produced 2.4 percent of labor income, it had 4.6 percent of employment. The grazing sector produced 0.1 percent of labor income; it had 2.6 percent of employment.

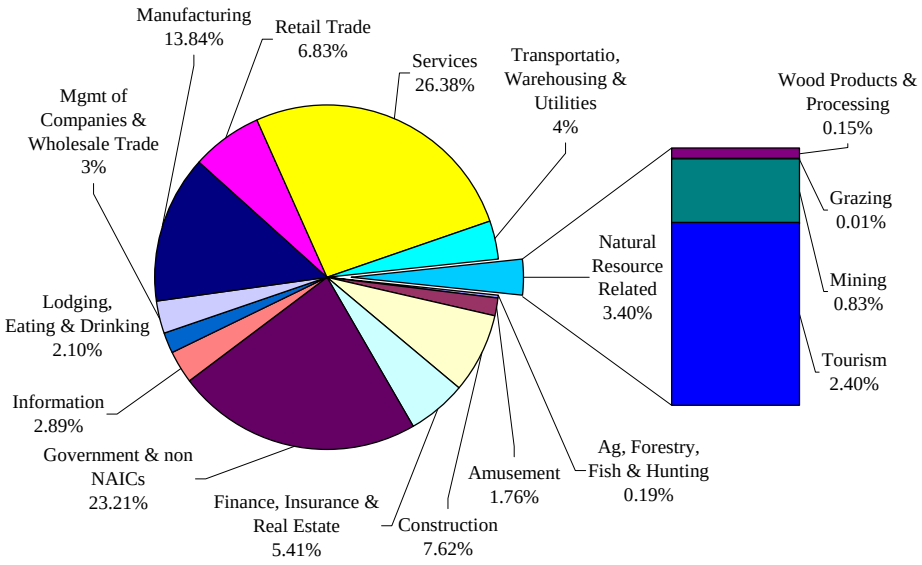

Figure A7: Pima County, Arizona 2002 Labor Income (IMPLAN)

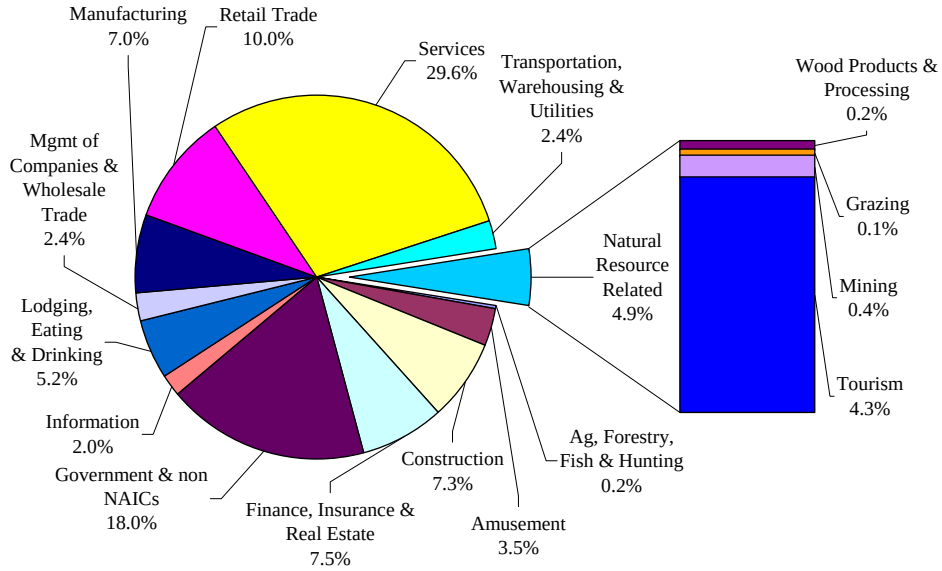

Figure A8: Pima County, Arizona 2002 Employment (IMPLAN)

Pinal County, Arizona

Figure A9 displays the relative size of the labor income produced in the natural resource related sectors to the county-wide economy in 2002. Forest related sectors represented only 3.6 percent of the labor income in the Pinal County economy. Within that, tourism was the largest sector. Figure A10 shows that natural resource related employment represented 7.24 percent of county employment in 2002. Tourism produced 1.8 percent of labor income and 4.6 percent of employment. The grazing sector produced 0.12 percent of labor income; and it had 1.22 percent of employment.

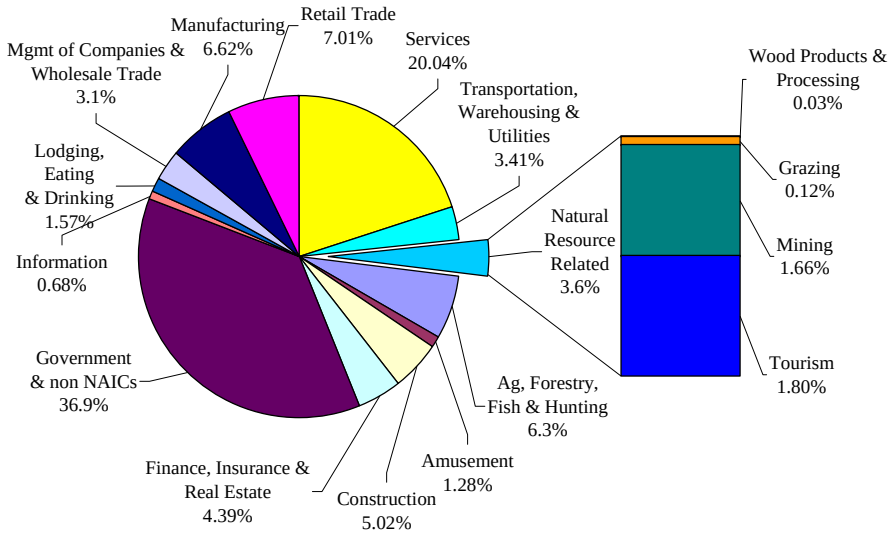

Figure A9: Pinal County, Arizona 2002 Labor Income (IMPLAN)

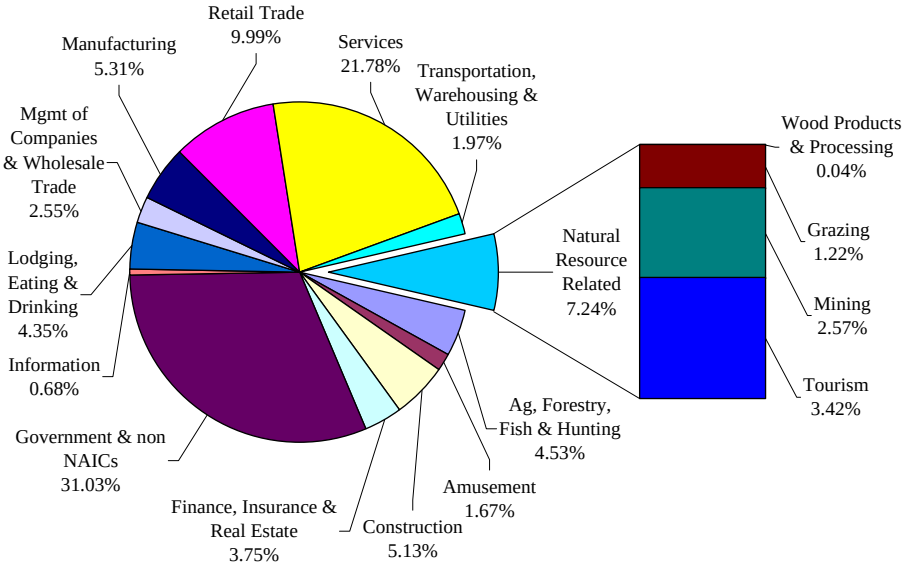

Figure A10: Pinal County, Arizona 2002 Employment (IMPLAN)

Santa Cruz County, Arizona

Figure A11 displays the relative size of the labor income produced in the natural resource related sectors to the county-wide economy in 2002. Forest related sectors represented only 2.5 percent of the labor income in

the Santa Cruz County economy. Within that, tourism was the largest sector. Figure A12 shows that natural resource related employment represented 5.7 percent of county employment in 2002. Tourism produced 2.4 percent of labor income and 4.4 percent of employment. The grazing sector produced 0.1 percent of labor income; and it had 1.2 percent of employment.

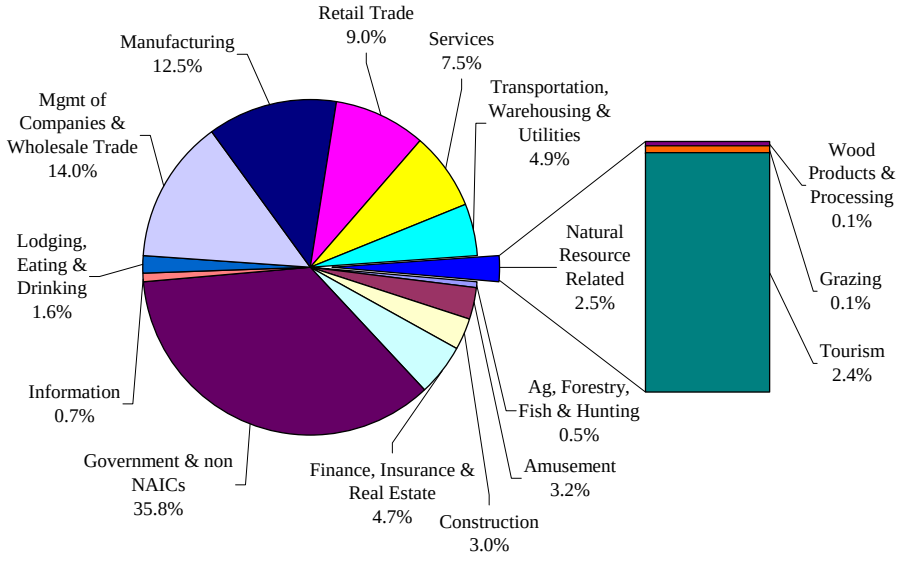

Figure A11: Santa Cruz County, Arizona 2002 Labor Income (IMPLAN)

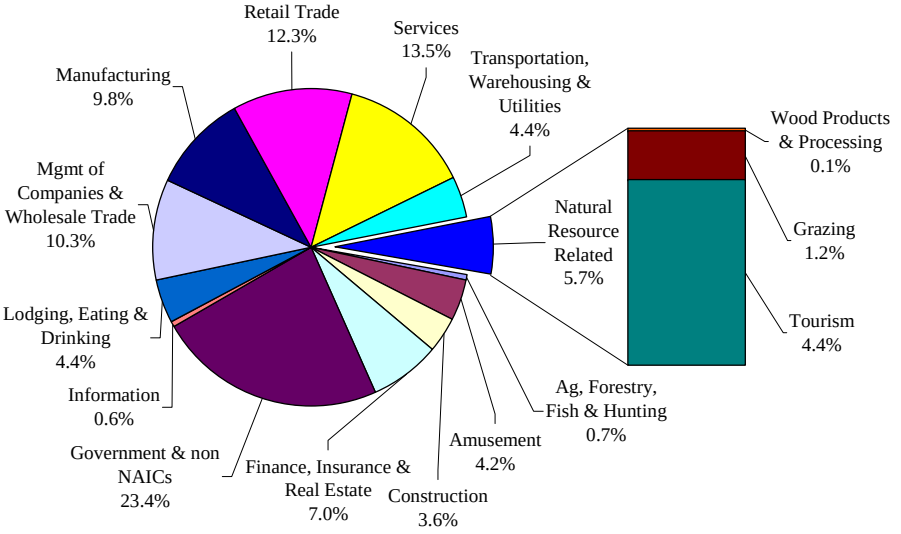

Figure A12: Santa Cruz County, Arizona 2002 Employment (IMPLAN)

Appendix B: Designated Areas on the Coronado NF

Designated Area Type	Name	District	Mountain Range
Boating	Parker Canyon Lake	Sierra Vista	Huachuca
Boating	Riggs Flat	Safford	Pinaleño

Botanical Area	Wild Chili Botanical Area	Nogales	Tumacacori
Cave	Cave of the Bells	Nogales	Santa Rita
Cave	Crystal	Douglas	Chiricahua
Cave	Happy Jack	Sierra Vista	Huachuca
Cave	Onyx	Nogales	Santa Rita
Cave	Peppersauce	Sierra Vista	Huachuca
Dispersed Site	Arcadia Overflow	Safford	Pinaleño
Dispersed Site	Bigelow/Bear Wallow	Santa Catalina	Santa Catalina
Dispersed Site	Blue-Alamo Canyon	Nogales	Tumacacori
Dispersed Site	Bull Spring	Santa Catalina	Santa Catalina
Dispersed Site	Bullock Corrals	Santa Catalina	Santa Catalina
Dispersed Site	Camp Bonita	Santa Catalina	Santa Catalina
Dispersed Site	Cargodera Road	Santa Catalina	Santa Catalina
Dispersed Site	Charouleau Gap	Santa Catalina	Santa Catalina
Dispersed Site	Chesley Flat	Safford	Pinaleño
Dispersed Site	Chimney Rock	Santa Catalina	Santa Catalina
Dispersed Site	Chiva Falls	Santa Catalina	Santa Catalina
Dispersed Site	Cinninaham	Safford	Pinaleño
Dispersed Site	Cluff Dairy	Safford	Pinaleño
Dispersed Site	Control Road (Lower)	Santa Catalina	Santa Catalina
Dispersed Site	Control Road (Upper)	Santa Catalina	Santa Catalina
Dispersed Site	Cottonwood	Santa Catalina	Santa Catalina
Dispersed Site	CP Flat	Safford	Pinaleño
Dispersed Site	Cruz Canyon	Nogales	Tumacacori
Dispersed Site	Gardner Canyon	Nogales	Santa Rita
Dispersed Site	Grand View Peak	Safford	Pinaleño
Dispersed Site	Grant Creek	Safford	Pinaleño
Dispersed Site	Happy Valley	Santa Catalina	Santa Catalina
Dispersed Site	Hell's Hole	Safford	Pinaleño
Dispersed Site	Incinerator Ridge	Santa Catalina	Santa Catalina
Dispersed Site	Kentucky Camp	Nogales	Santa Rita
Dispersed Site	Large Rock	Safford	Pinaleño
Dispersed Site	Lizard Rock	Santa Catalina	Santa Catalina
Dispersed Site	Loop	Safford	Pinaleño
Dispersed Site	Lower Walker Canyon	Nogales	Tumacacori
Dispersed Site	Moonshine	Safford	Pinaleño
Dispersed Site	Nugget Canyon	Santa Catalina	Santa Catalina
Dispersed Site	Observatory	Santa Catalina	Santa Catalina
Dispersed Site	Old Prison Camo	Safford	Pinaleño
Dispersed Site	Peppersauce West	Santa Catalina	Santa Catalina
Dispersed Site	Peter's Flat	Safford	Pinaleño
Dispersed Site	Powers Cabin	Safford	Galiuro
Dispersed Site	Race Track	Santa Catalina	Santa Catalina
Dispersed Site	Rice Peak	Santa Catalina	Santa Catalina
Dispersed Site	Riffs Flat	Safford	Pinaleño
Dispersed Site	Soldier Camo	Safford	Pinaleño
Dispersed Site	Sykes Knob	Santa Catalina	Santa Catalina
Dispersed Site	Tanque Verde Falls	Santa Catalina	Santa Catalina
Dispersed Site	The Lake	Santa Catalina	Santa Catalina

Dispersed Site	Upper Hospital Flat	Safford	Pinaleño
Dispersed Site	Upper Walker Canyon	Nogales	Tumacacori
Dispersed Site	Wildcat Shooting Sight	Santa Catalina	Santa Catalina
Dispersed Site	Fish Canyon	Nogales	Santa Rita
Dispersed Site	Nogales Sycamore Canyon	Nogales	Tumacacori
Dispersed Site	Nuttall Ridge	Safford	Pinaleño
Dispersed Site	Pena Blanco Canyon	Nogales	Tumacacori
Dispersed Site	Snow Flat	Safford	Pinaleño
Dispersed Site	Sycamore Backcountry Area	Sierra Vista	Huachuca
Dispersed Site	Twilight	Safford	Pinaleño
Family Campground	Arcadia	Safford	Pinaleño
Family Campground	Bathtub	Douglas	Chiricahua
Family Campground	Bog Springs	Nogales	Santa Rita
Family Campground	Catalina State Park	Santa Catalina	Santa Catalina
Family Campground	Cochise Stronghold	Douglas	Dragoon
Family Campground	Cunningham	Safford	Pinaleño
Family Campground	Cypress Park	Douglas	Chiricahua
Family Campground	General Hitchcock	Santa Catalina	Santa Catalina
Family Campground	Geronimo	Douglas	Peloncillo
Family Campground	Gordon Hirabayashi	Santa Catalina	Santa Catalina
Family Campground	Herb Martyr	Douglas	Chiricahua
Family Campground	Hospital Flat	Safford	Pinaleño
Family Campground	Idlewilde	Douglas	Chiricahua
Family Campground	John Hands	Douglas	Chiricahua
Family Campground	Lakeview	Sierra Vista	Huachuca
Family Campground	Noon Creek	Safford	Pinaleño
Family Campground	Peppersauce	Santa Catalina	Santa Catalina
Family Campground	Pinery Canyon	Douglas	Chiricahua
Family Campground	Ramsey Vista	Sierra Vista	Huachuca
Family Campground	Reef Townsite Campground	Sierra Vista	Huachuca
Family Campground	Riggs Flat	Safford	Pinaleño
Family Campground	Rucker Lake	Douglas	Chiricahua
Family Campground	Rucker Forest Camp	Douglas	Chiricahua
Family Campground	Rustler Park	Douglas	Chiricahua
Family Campground	Shannon	Safford	Pinaleño
Family Campground	Snow Flat	Safford	Pinaleño
Family Campground	Soldier Creek	Safford	Pinaleño
Family Campground	Stewart	Douglas	Chiricahua
Family Campground	Stockton Pass	Safford	Pinaleño
Family Campground	Sunny Flat	Douglas	Chiricahua
Family Campground	Sycamore	Douglas	Chiricahua
Family Campground	Treasure Park	Safford	Pinaleño
Family Campground	West Turkey Creek	Douglas	Chiricahua
Family Campground	White Rock	Nogales	Tumacacori
Family Campground	General Hitchcock	Santa Catalina	Santa Catalina
Family Campground	Molino Basin	Santa Catalina	Santa Catalina
Family Campground	Rose Canyon	Santa Catalina	Santa Catalina
Family Campground	Spencer Campground	Santa Catalina	Santa Catalina
Family Picnic	Alder	Santa Catalina	Santa Catalina

Family Picnic	Bear Canyon Overlook	Santa Catalina	Santa Catalina
Family Picnic	Box Elder	Santa Catalina	Santa Catalina
Family Picnic	Cactus	Santa Catalina	Santa Catalina
Family Picnic	Catalina State Park	Santa Catalina	Santa Catalina
Family Picnic	Chihuahua Pine	Santa Catalina	Santa Catalina
Family Picnic	Cypress	Santa Catalina	Santa Catalina
Family Picnic	Inspiration Rock	Santa Catalina	Santa Catalina
Family Picnic	Loma Linda	Santa Catalina	Santa Catalina
Family Picnic	Lower Sabino	Santa Catalina	Santa Catalina
Family Picnic	Lower Sabino East Dam	Santa Catalina	Santa Catalina
Family Picnic	Lower Sabino West Dam	Santa Catalina	Santa Catalina
Family Picnic	Lower Thumb Rock	Nogales	Tumacacori
Family Picnic	Madera Canyon	Nogales	Santa Rita
Family Picnic	Madera Trailhead	Nogales	Santa Rita
Family Picnic	Marshall Gulch	Santa Catalina	Santa Catalina
Family Picnic	Middle Bear Canyon	Santa Catalina	Santa Catalina
Family Picnic	Mt. Wrightson (Roundup)	Nogales	Santa Rita
Family Picnic	Noon Creek	Safford	Pinaleño
Family Picnic	Old Noon Creek	Safford	Pinaleño
Family Picnic	Red Rock	Nogales	Tumacacori
Family Picnic	Sabino Canyon Group	Santa Catalina	Santa Catalina
Family Picnic	Sabino Dam Overlook	Santa Catalina	Santa Catalina
Family Picnic	South Fork	Douglas	Chiricahua
Family Picnic	Sykes Knob	Santa Catalina	Santa Catalina
Family Picnic	Upper Sabino Canyon	Santa Catalina	Santa Catalina
Family Picnic	Upper Thumb Rock	Nogales	Tumacacori
Family Picnic	Wet Canyon	Safford	Pinaleño
Family Picnic	Whipple	Nogales	Santa Rita
Family Picnic	White House	Nogales	Santa Rita
Fire Lookouts Cabins Overnight	Kentucky Camp Rental Cabin	Nogales	Santa Rita
Fishing Site	Pena Blanca Lake	Nogales	Tumacacori
Fishing Site	Riggs Flat	Safford	Pinaleño
Fishing Site	Rose Canyon Lake	Santa Catalina	Santa Catalina
Forest Service	Sollers Point Resident Housing	Santa Catalina	Santa Catalina
Forest Service	Palisades Visitor Center	Santa Catalina	Santa Catalina
Group Campground	Calabasas	Nogales	Tumacacori
Group Campground	Camp Rucker	Douglas	Chiricahua
Group Campground	Catalina State Park	Santa Catalina	Santa Catalina
Group Campground	Molino Basin	Santa Catalina	Santa Catalina
Group Campground	Peppersauce	Santa Catalina	Santa Catalina
Group Campground	Rock Bluff	Sierra Vista	Huachuca
Group Campground	Showers Point	Santa Catalina	Santa Catalina
Group Campground	Snow Flat	Safford	Pinaleño
Group Campground	Stockton Pass	Safford	Pinaleño
Group Campground	Treasure Park	Safford	Pinaleño
Group Campground	Twlight	Safford	Pinaleño
Group Campground	Upper Arcadia	Safford	Pinaleño
Group Campground	Upper Hospital Flat	Safford	Pinaleño
Group Campground	Whitetail Future	Santa Catalina	Santa Catalina

Group Picnic	Cactus	Santa Catalina	Santa Catalina
Group Picnic	Rose Canyon Group Site #1	Santa Catalina	Santa Catalina
Group Picnic	Rose Canyon Group Site #2	Santa Catalina	Santa Catalina
Horse Camp	Catalina State Park	Santa Catalina	Santa Catalina
Horse Camp	Clark Peak Corrals	Safford	Pinaleño
Horse Camp	Columbine Corrals	Safford	Pinaleño
Horse Camp	Deer Creek	Safford	Galiuro
Horse Camp	Gordon Hirabayashi	Santa Catalina	Santa Catalina
Horse Camp	Round the Mountain	Safford	Pinaleño
Hotel/Lodge/Resort Private Owner	Bellota Ranch	Santa Catalina	Santa Catalina
Hotel/Lodge/Resort Private Owner	Santa Rita Lodge	Nogales	Santa Rita
Information Site	Catalina State Park Entry Station	Santa Catalina	Santa Catalina
Information Site	Douglas District Office	Douglas	N/A
Information Site	Molino Fee Station	Santa Catalina	Santa Catalina
Information Site	Nogales District Office	Nogales	N/A
Information Site	Sabino Canyon Fee Station	Santa Catalina	Santa Catalina
Information Site	Safford District Office	Safford	N/A
Information Site	Sierra Vista District Office	Sierra Vista	N/A
Information Site	Supervisor's Office	Tucson	N/A
International Observatory	Mt. Graham International Observatory	Safford	Pinaleño
Interpretive Site	Sabino Canyon Nature Trail	Santa Catalina	Santa Catalina
Interpretive Site Major	Cave Creek Visitor Center	Douglas	Chiricahua
Interpretive Site Major	Columbine Visitor Center	Safford	Pinaleño
Interpretive Site Major	Palisades Visitor Center	Santa Catalina	Santa Catalina
Interpretive Site Major	Sabino Canyon Vistor Center	Santa Catalina	Santa Catalina
Interpretive Site Major	Smithsonian Visitor Center	Nogales	Santa Rita
Interpretive Site Minor	Camp Ruck Interpretive Trail	Douglas	Chiricahua
Interpretive Site Minor	Camp Rucker Historic Site	Douglas	Chiricahua
Interpretive Site Minor	Cave Creek Nature Trail	Douglas	Chiricahua
Interpretive Site Minor	Chesley Flat	Safford	Pinaleño
Interpretive Site Minor	Cochise Stronghold Historical Marker	Douglas	Dragoon
Interpretive Site Minor	Cochise Stronghold Interp. Trail	Douglas	Dragoon
Interpretive Site Minor	Cochise Stronghold Nature Trail	Douglas	Santa Rita
Interpretive Site Minor	Columbine VIC Nature Trail	Safford	Pinaleño
Interpretive Site Minor	Council Rock Interpretive Trail	Douglas	Dragoon
Interpretive Site Minor	Dragoon Springs Stage Stop	Douglas	Dragoon
Interpretive Site Minor	Geronimo Pass Interpretive Site	Douglas	Peloncillo
Interpretive Site Minor	Gordon Hirabayashi	Santa Catalina	Santa Catalina
Interpretive Site Minor	Hospital Flat Trail	Safford	Pinaleño
Interpretive Site Minor	Kentucky Camp	Nogales	Santa Rita
Interpretive Site Minor	Lowell House	Santa Catalina	Santa Catalina
Interpretive Site Minor	Peter’s Flat	Safford	Pinaleño
Interpretive Site Minor	Pinery Canyon Mill Site Cabin	Douglas	Chiricahua
Interpretive Site Minor	Proctor Parking	Nogales	Santa Rita
Interpretive Site Minor	Reef Townsite	Sierra Vista	Huachuca
Interpretive Site Minor	Reef Townsite Mining	Sierra Vista	Huachuca
Interpretive Site Minor	Romero Ruin Trial	Santa Catalina	Santa Catalina
Interpretive Site Minor	Rucker Baber Shop	Douglas	Chiricahua

Interpretive Site Minor	Rucker Information Site	Douglas	Chiricahua
Interpretive Site Minor	Sabino Canyon Bajada Nature Trail	Santa Catalina	Santa Catalina
Interpretive Site Minor	Santa Rita Water & Mining Co.	Nogales	Santa Rita
Interpretive Site Minor	Shannon	Safford	Pinaleño
Interpretive Site Minor	Slavin Interpretive Site	Douglas	Dragoon
Interpretive Site Minor	Treasure Park	Safford	Pinaleño
Interpretive Site Minor	Upper Hospital Flat	Safford	Pinaleño
Interpretive Site Minor	Upper Hospital Flat 1	Safford	Pinaleño
Interpretive Site Minor	Upper Hospital Flat 2	Safford	Pinaleño
Interpretive Site Minor	Whipple Nature Trail	Nogales	Santa Rita
Interpretive Site Minor	White House Ruins	Nogales	Santa Rita
Interpretive Site Minor	Sabino Canyon Interpretive Area	Santa Catalina	Santa Catalina
Mountain Bike Route	Elephant Head	Nogales	Santa Rita
Municipal	Summerhaven Town	Santa Catalina	Santa Catalina
Observation Site	Aspen Vista	Santa Catalina	Santa Catalina
Observation Site	Babad Do'ag	Santa Catalina	Santa Catalina
Observation Site	Cathedral Vista Point	Douglas	Chiricahua
Observation Site	Geology Vista	Santa Catalina	Santa Catalina
Observation Site	Hageas Point	Safford	Pinaleño
Observation Site	Molino Canyon Vista	Santa Catalina	Santa Catalina
Observation Site	San Pedro Vista	Santa Catalina	Santa Catalina
Observation Site	Seven Cataracts Vista	Santa Catalina	Santa Catalina
Observation Site	Thimble Peak Vista	Santa Catalina	Santa Catalina
Observation Site	Windy Point Vista	Santa Catalina	Santa Catalina
Organization Site-F.S. Owned	Girl Scout Camp	Santa Catalina	Santa Catalina
Organization Site-F.S. Owned	Kent Springs Center	Nogales	Santa Rita
Organization Site-Privately Owned	Amphi Camp	Santa Catalina	Santa Catalina
Organization Site-Privately Owned	Arizona Boys Ranch	Santa Catalina	Santa Catalina
Organization Site-Privately Owned	Baptist Camp	Santa Catalina	Santa Catalina
Organization Site-Privately Owned	Boy Scout Camp	Santa Catalina	Santa Catalina
Organization Site-Privately Owned	LDS Camp	Santa Catalina	Santa Catalina
Organization Site-Privately Owned	Organization Camp	Safford	Pinaleño
Organization Site-Privately Owned	Pine Canyon United Methodist Camp	Douglas	Chiricahua
Organization Site-Privately Owned	Presbyterian Camp	Santa Catalina	Santa Catalina
Playground or Special Sport Site	Reddington Pass Backcountry Tour. Area	Santa Catalina	Santa Catalina
Playground or Special Sport Site	Rosemont Backcountry Touring Area	Nogales	Santa Rita
Playground Park Special Sport Site	Alambre Staging OHV	Santa Catalina	Santa Catalina
Playground Park Special Sport Site	Amphitheater	Nogales	Santa Rita
Playground Park Special Sport Site	Grant Hill Mountain Bike Loop	Safford	Pinaleño
Playground Park Special Sport Site	Pusch Ridge Archery Range	Santa Catalina	Santa Catalina
Playground Park Special Sport Site	Three Feathers	Santa Catalina	Santa Catalina
Possible Wild & Scenic River	Ash Creek	Safford	Pinaleño
Possible Wild & Scenic River	Canada Del Oro	Santa Catalina	Santa Catalina

Possible Wild & Scenic River	Grant Creek	Safford	Pinaleño
Possible Wild & Scenic River	Lower Cima Creek	Douglas	Chiricahua
Possible Wild & Scenic River	Post Creek	Safford	Pinaleño
Possible Wild & Scenic River	Redfield Canyon	Safford	Galiuro
Possible Wild & Scenic River	Romero Canyon	Santa Catalina	Santa Catalina
Possible Wild & Scenic River	Rucker Canyon	Douglas	Chiricahua
Possible Wild & Scenic River	Sabino Canyon	Santa Catalina	Santa Catalina
Possible Wild & Scenic River	South Fork Cave Creek	Douglas	Chiricahua
Recreation Concession Site	Parker Canyon Marina & Store	Sierra Vista	Huachuca
Recreation Residence	Bear Wallow Summerhomes	Santa Catalina	Santa Catalina
Recreation Residence	Carter Canyon Summerhomes	Santa Catalina	Santa Catalina
Recreation Residence	Cave Creek Summerhomes	Douglas	Chiricahua
Recreation Residence	Columbine Sumerhomes	Safford	Pinaleño
Recreation Residence	Rustler Park Summerhomes	Douglas	Chiricahua
Recreation Residence	Soldier Camp Summerhomes	Santa Catalina	Santa Catalina
Recreation Residence	South Fork Summerhomes	Douglas	Chiricahua
Recreation Residence	Turkey Creek Summerhomes	Douglas	Chiricahua
Recreation Residence	Turkey Flat Summerhomes	Safford	Pinaleño
Recreation Residence	Loma Linda Summerhomes	Santa Catalina	Santa Catalina
Recreation Residence	Upper Sabino Summerhomes	Santa Catalina	Santa Catalina
Recreation Residence	Willow Canyon Summerhomes	Santa Catalina	Santa Catalina
Research Natural Area	Butterfly	Santa Catalina	Santa Catalina
Research Natural Area	Canelo	Sierra Vista	Huachuca
Research Natural Area	Elgin	Sierra Vista	Huachuca
Research Natural Area	Gooding	Nogales	Tumacacori
Research Natural Area	Goody	Safford	Pinaleño
Research Natural Area	Pole Bridge	Douglas	Chiricahua
Research Natural Area	Pole Bridge RNA Extension	Douglas	Chiricahua
Research Natural Area	Santa Catalina	Santa Catalina	Santa Catalina
Research Ranch	Elgin Research Ranch	Sierra Vista	Huachuca
Scenic/Sightseeing Route	Arizona Highway 83	Sierra Vista	Huachuca
Scenic/Sightseeing Route	Box Canyon Road (Forest Road 62)	Nogales	Santa Rita
Scenic/Sightseeing Route	Canelo Hills Loop	Sierra Vista	Huachuca
Scenic/Sightseeing Route	Carr Canyon (Forest Road 38)	Sierra Vista	Huachuca
Scenic/Sightseeing Route	Cave Creek/Portal/Paradise/Forest Road 42/4	Santa Catalina	Santa Catalina
	Charouleau Gap Road	Santa Catalina	Santa Catalina
Scenic/Sightseeing Route	Control Road	Santa Catalina	Santa Catalina
Scenic/Sightseeing Route	Happy Valley	Santa Catalina	Santa Catalina
Scenic/Sightseeing Route	Harshaw (Forest Road 49)	Sierra Vista	Huachuca
Scenic/Sightseeing Route	Madera Canyon	Nogales	Santa Rita
Scenic/Sightseeing Route	Middlemarch (Forest Road 345)	Douglas	Dragoon
Scenic/Sightseeing Route	Mt. Hopkins Road	Nogales	Santa Rita
Scenic/Sightseeing Route	Pinery Canyon (Forest Road 42)	Douglas	Chiricahua
Scenic/Sightseeing Route	Proctor Interpretive Trail	Nogales	Santa Rita
Scenic/Sightseeing Route	Redington Pass Road	Santa Catalina	Santa Catalina
Scenic/Sightseeing Route	Ruby Road (AZ 289, Forest Road 39)	Nogales	Tumacacori
Scenic/Sightseeing Route	Rucker/Texas Canyon (Forest Road 74)	Douglas	Chiricahua
Scenic/Sightseeing Route	Sabino Canyon Road	Santa Catalina	Santa Catalina
Scenic/Sightseeing Route	Sky Island Scenic Byway	Santa Catalina	Santa Catalina

Scenic/Sightseeing Route	State Highway 83	Nogales	Santa Rita
Scenic/Sightseeing Route	Stockton Pass	Safford	Pinaleño
Scenic/Sightseeing Route	Swift Trail	Safford	Pinaleño
Scenic/Sightseeing Route	Turkey Creek (Forest Road 41)	Douglas	Chiricahua
Ski Area	Mt. Lemmon Ski Valley	Santa Catalina	Santa Catalina
Trailhead	Agua Caliente Hill	Santa Catalina	Santa Catalina
Trailhead	Amphitheater	Nogales	Santa Rita
Trailhead	Aqua Caliente	Nogales	Santa Rita
Trailhead	Arizona Trail at Parker Lake	Sierra Vista	Huachuca
Trailhead	Atascosa	Nogales	Tumacacori
Trailhead	Babad Do'ag	Santa Catalina	Santa Catalina
Trailhead	Bear Canyon	Safford	Pinaleño
Trailhead	Bear Canyon-east end of VC Parking	Santa Catalina	Santa Catalina
Trailhead	Bellota/Italian Spring	Santa Catalina	Santa Catalina
Trailhead	Bigelow (Butterfly)	Santa Catalina	Santa Catalina
Trailhead	Bigelow (Palisades)	Santa Catalina	Santa Catalina
Trailhead	Blue Jay Ridge	Safford	Pinaleño
Trailhead	Bog Springs	Nogales	Santa Rita
Trailhead	Box Camp	Santa Catalina	Santa Catalina
Trailhead	Box Canyon OHV	Nogales	Santa Rita
Trailhead	Brown	Sierra Vista	Huachuca
Trailhead	Brush Corral	Santa Catalina	Santa Catalina
Trailhead	Bug Spring	Santa Catalina	Santa Catalina
Trailhead	Butterfly	Santa Catalina	Santa Catalina
Trailhead	Canada del Oro	Santa Catalina	Santa Catalina
Trailhead	Canada del Oro/Sanmaniego	Santa Catalina	Santa Catalina
Trailhead	Canelo	Sierra Vista	Huachuca
Trailhead	Carr Canyon Perimeter	Sierra Vista	Huachuca
Trailhead	Catalina State Park End of Road	Santa Catalina	Santa Catalina
Trailhead	Cave	Nogales	Santa Rita
Trailhead	Clark Peak	Safford	Pinaleño
Trailhead	Cochise Equestrian	Douglas	Dragoon
Trailhead	Cochise Stronghold	Douglas	Dragoon
Trailhead	Cody	Santa Catalina	Santa Catalina
Trailhead	Columbine	Safford	Pinaleño
Trailhead	Cottonwood	Douglas	Chiricahua
Trailhead	Crystal Spring	Santa Catalina	Santa Catalina
Trailhead	Cunningham Loop	Safford	Pinaleño
Trailhead	Davis Spring	Santa Catalina	Santa Catalina
Trailhead	Deadman Trail	Safford	Pinaleño
Trailhead	Deer Creek	Safford	Galiuro
Trailhead	Dutch Henry Canyon	Safford	Pinaleño
Trailhead	Dutch Henry Lower	Safford	Pinaleño
Trailhead	East Divide	Safford	Galiuro
Trailhead	Elephant Head	Nogales	Santa Rita
Trailhead	Emigrant Canyon	Douglas	Chiricahua
Trailhead	Fife	Douglas	Chiricahua
Trailhead	Finger Rock/Pontatoc	Santa Catalina	Santa Catalina
Trailhead	Florida	Nogales	Santa Rita

Trailhead	Four Springs	Nogales	Santa Rita
Trailhead	Frye Canyon	Safford	Pinaleño
Trailhead	Gardner	Nogales	Santa Rita
Trailhead	Gardner & Cave Canyon OHV	Nogales	Santa Rita
Trailhead	Grant Creek	Safford	Pinaleño
Trailhead	Grant Creek Lower	Safford	Pinaleño
Trailhead	Grant Hill Loop	Safford	Pinaleño
Trailhead	Green	Douglas	Chiricahua
Trailhead	Green Mountain (Hitchcock)	Santa Catalina	Santa Catalina
Trailhead	Green Mountain (Near San Pedro Vista)	Santa Catalina	Santa Catalina
Trailhead	Greenhouse	Douglas	Chiricahua
Trailhead	Guindani Loop	Sierra Vista	Huachuca
Trailhead	Harshaw	Sierra Vista	Huachuca
Trailhead	Heliograph	Safford	Pinaleño
Trailhead	Herb Martyr	Douglas	Chiricahua
Trailhead	Hidden Spring	Santa Catalina	Santa Catalina
Trailhead	High Creek	Safford	Galiuro
Trailhead	Hoovey	Douglas	Chiricahua
Trailhead	Ida Canyon	Sierra Vista	Huachuca
Trailhead	Incinerator Ridge	Santa Catalina	Santa Catalina
Trailhead	Jesus Babcock	Safford	Pinaleño
Trailhead	Jesus Goudy Ridge	Safford	Pinaleño
Trailhead	Kentucky Camp	Nogales	Santa Rita
Trailhead	Ladybug	Safford	Pinaleño
Trailhead	Ladybug Saddle	Safford	Pinaleño
Trailhead	Last Chance	Santa Catalina	Santa Catalina
Trailhead	Linda Vista	Santa Catalina	Santa Catalina
Trailhead	Lower Tanque Verde	Santa Catalina	Santa Catalina
Trailhead	Lutz	Sierra Vista	Huachuca
Trailhead	Marshall Gulch	Santa Catalina	Santa Catalina
Trailhead	Middle March	Douglas	Dragoon
Trailhead	Miller	Sierra Vista	Huachuca
Trailhead	Miller Canyon Perimeter	Sierra Vista	Huachuca
Trailhead	Miller Creek	Santa Catalina	Santa Catalina
Trailhead	Mint Spring	Santa Catalina	Santa Catalina
Trailhead	Molino Basin	Santa Catalina	Santa Catalina
Trailhead	Molino Basin End of Road	Santa Catalina	Santa Catalina
Trailhead	Molino Basin Group Site	Santa Catalina	Santa Catalina
Trailhead	Molino Basin/Prison Camp	Santa Catalina	Santa Catalina
Trailhead	Monte Vista	Douglas	Chiricahua
Trailhead	Montezuma Pass	Sierra Vista	Huachuca
Trailhead	Morse Canyon	Douglas	Chiricahua
Trailhead	Mt. Lemmon/Aspen	Santa Catalina	Santa Catalina
Trailhead	Noon Creek Ridge	Safford	Pinaleño
Trailhead	Old Baldy	Nogales	Santa Rita
Trailhead	Onion Saddle	Douglas	Chiricahua
Trailhead	Oracle Ridge (Lower)	Santa Catalina	Santa Catalina
Trailhead	Oracle Ridge	Santa Catalina	Santa Catalina
Trailhead	Oversite Canyon	Sierra Vista	Huachuca

Trailhead	Palisades	Santa Catalina	Santa Catalina
Trailhead	Papago Well	Santa Catalina	Santa Catalina
Trailhead	Parker Canyon Lakeshore Trail	Sierra Vista	Huachuca
Trailhead	Pima Canyon	Santa Catalina	Santa Catalina
Trailhead	Pine Gulch	Douglas	Chiricahua
Trailhead	Pinery-Horsefall	Douglas	Chiricahua
Trailhead	Price	Douglas	Chiricahua
Trailhead	Proctor	Nogales	Santa Rita
Trailhead	Ramsey Vista	Sierra Vista	Huachuca
Trailhead	Rattlesnake	Douglas	Chiricahua
Trailhead	Rattlesnake Canyon	Safford	Galiuro
Trailhead	Red Ridge	Santa Catalina	Santa Catalina
Trailhead	Rose Canyon Lake	Santa Catalina	Santa Catalina
Trailhead	Rosemont OHV	Nogales	Santa Rita
Trailhead	Round the Mountain	Safford	Pinaleño
Trailhead	Rucker	Douglas	Chiricahua
Trailhead	Rustler Park	Douglas	Chiricahua
Trailhead	Sanmaniego	Santa Catalina	Santa Catalina
Trailhead	Sanmaniego/Canado del Oro	Santa Catalina	Santa Catalina
Trailhead	Saulsberry	Douglas	Chiricahua
Trailhead	Sawmill/Carr Peak	Sierra Vista	Huachuca
Trailhead	Shake	Safford	Pinaleño
Trailhead	Shake-State Route 366	Safford	Pinaleño
Trailhead	Shannon	Safford	Pinaleño
Trailhead	Shaw Peak	Douglas	Chiricahua
Trailhead	Shuttle Stop 9	Santa Catalina	Santa Catalina
Trailhead	Silver Peak	Douglas	Chiricahua
Trailhead	Skeleton Canyon	Douglas	Peloncillo
Trailhead	Slavin Gulch	Douglas	Dragoon
Trailhead	Snowshed	Douglas	Chiricahua
Trailhead	Soldier	Santa Catalina	Santa Catalina
Trailhead	Soldier Creek	Safford	Pinaleño
Trailhead	South Fork	Douglas	Chiricahua
Trailhead	South Skeleton	Douglas	Peloncillo
Trailhead	Sunnyside Canyon	Sierra Vista	Huachuca
Trailhead	Sunset	Santa Catalina	Santa Catalina
Trailhead	Super	Nogales	Santa Rita
Trailhead	Sutherland	Santa Catalina	Santa Catalina
Trailhead	Sycamore Canyon	Nogales	Tumacacori
Trailhead	Sycamore Reservoir	Santa Catalina	Santa Catalina
Trailhead	Taylor Canyon	Safford	Pinaleño
Trailhead	Temporal	Nogales	Santa Rita
Trailhead	Tripp Canyon	Safford	Pinaleño
Trailhead	Turkey Creek	Santa Catalina	Santa Catalina
Trailhead	Turkey Flat	Safford	Pinaleño
Trailhead	Turkey Pen	Douglas	Chiricahua
Trailhead	Turtle Mountain	Douglas	Chiricahua
Trailhead	Upper Arcadia	Safford	Pinaleño
Trailhead	Upper Tanque Verde	Santa Catalina	Santa Catalina

Trailhead	Ventana Canyon	Santa Catalina	Santa Catalina
Trailhead	Vista (Geology Vista)	Santa Catalina	Santa Catalina
Trailhead	Vista (Windy Point Vista)	Santa Catalina	Santa Catalina
Trailhead	Walker	Nogales	Santa Rita
Trailhead	Webb Peak	Safford	Pinaleño
Trailhead	West Divide	Safford	Galiuro
Trailhead	West Stronghold	Douglas	Dragoon
Trailhead	Witch	Douglas	Chiricahua
Trailhead	Wood Canyon	Douglas	Chiricahua
Wilderness	Chircahua Wilderness	Douglas	Chiricahua
Wilderness	Galiuro Wilderness Area	Safford	Galiuro
Wilderness	Miller Peak Wilderness	Sierra Vista	Huachuca
Wilderness	Mt. Wrightson Wilderness	Nogales	Santa Rita
Wilderness	Pajarita Wilderness	Nogales	Tumacacori
Wilderness	Pusch Ridge Wilderness	Santa Catalina	Santa Catalina
Wilderness	Rincon Wilderness	Santa Catalina	Santa Catalina
Wilderness	Santa Teresa Wilderness Area	Safford	Santa Teresa
Wilderness Study Area	Mt. Graham Wilderness Study Area	Safford	Pinaleño
Zoological Botanical Area	Guadalupe Canyon	Douglas	Peloncillo
Zoological Botanical Area	South Fork Cave Creek	Douglas	Chiricahua

Source: Coronado National Forest, GIS Data Base, T. Austin

Appendix C: Recreation and Grazing Economic Contribution Process Paper

Coronado National Forest

Recreation and Grazing Economic Contribution

Process Paper

Prepared by:
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for:
Coronodo National Forest

October 18, 2008

PROCESS PAPER:

Coronado National Forest November 2006 Contribution Analysis for Grazing, Recreation, and Wildlife Programs

Recreation and Wildlife:

Data Needs:

- National Forest visitation estimate for year of analysis
  - 2,296,000 National Forest Visits
  - Source: National Visitor Use Monitoring Report for the Coronado National Forest, 2005
- Division of total visitation between wildlife and recreation related activities.
  - Wildlife – 10 percent
  - Recreation – 90 percent
  - Source: *Spending Profiles of National Forest Visitors, NVUM Four Year Report* by Stynes and White, page 42, Table B-6 (Case Weights column)
- Division of visits by visitor use segments
  - Non-local day use: 7 percent
  - Non-local overnight on national forest: 5 percent
  - Non-local overnight off forest: 9 percent
  - Local day use: 62 percent
  - Local overnight on national forest: 4 percent
  - Local overnight off forest: 7 percent
  - Nonprimary (national forest was not reason for presence): 6 percent
  - Source: *Spending Profiles of National Forest Visitors, NVUM Four Year Report* by Stynes and White, page 26, Table A-2.
- Average persons per vehicle surveyed
  - Non-local day use: 2.3 persons
  - Non-local overnight on national forest: 2.5 persons
  - Non-local overnight off forest: 2.7 persons
  - Local day use: 2.1 persons
  - Local overnight on national forest: 2.5 persons
  - Local overnight off forest: 2.5 persons
  - Source: *Spending Profiles of National Forest Visitors, NVUM Four Year Report* by Stynes and White, page 31, National Average.
- Visitor spending profiles ($'s per party)
  - Wildlife Related
    - Non-local day: $40.71
    - Non-local overnight on national forest: $203.78
    - Non-local overnight off forest: $249.95
    - Local day: $44.03
    - Local overnight on national forest: $151.92
    - Local overnight off forest: $116.49

  - Non-Wildlife Related
    - Non-local day: $53.76
    - Non-local overnight on national forest : $151.33
    - Non-local overnight off forest: $244.46
    - Local day: $30.79
    - Local overnight on national forest: $119.49
    - Local overnight off forest: $116.03
  - Source: *Spending Profiles of National Forest Visitors, NVUM Four Year Report* by Stynes and White, page 40, Tables B-3 and B-4.

- Response Coefficients per $1,000,000 change in final demand (from IMPLAN model)
  - Wildlife Related
    - Non-local day: $505,837.75 of labor income and 20 jobs
    - Non-local overnight on national forest: $516,437.01 of labor income and 19.1 jobs
    - Non-local overnight off forest: $506,203.59 of labor income and 21.5 jobs
    - Local day: $490,969.13 of labor income and 18.3 jobs
    - Local overnight on national forest: $508,552.13 of labor income and 17.7 jobs
    - Local overnight off forest: $518,601.70 of labor income and 19.7 jobs
  - Non-Wildlife Related
    - Non-local day: $505,837.80 of labor income and 20 jobs
    - Non-local overnight on national forest: $516,437.00 of labor income and 19.1 jobs
    - Non-local overnight off forest: $506,203.60 of labor income and 21.5 jobs
    - Local day: $490,969.10 of labor income and 18.3 jobs
    - Local overnight on national forest: $508,552.10 of labor income and 17.7 jobs
    - Local overnight off forest: $518,601.70 of labor income and 19.7 jobs
  - Source: IMPLAN model, 2003 data
- GDP deflators for 2001, 2003, and 2006
  - 2002 – 1.1080
  - 2005 – 1.1559
  - 2006 – 1.1747

Recreation Contribution Analysis Process:

1. Divide total recreation between wildlife and recreation related visits.
    - National Forest Visits * Percent Wildlife related visits = Wildlife related National Forest Visits
    - National Forest Visits * Percent Recreation related visits = Recreation related National Forest Visits
2. Calculate the visits by visitor use segments
    - Wildlife related National Forest Visits * percentage for each visitor use segment = Wildlife related use by visitor use segment
    - Recreation related National Forest Visits * percentage for each visitor use segment = Recreation related use by visitor use segment
3. Convert spending profiles from $'s per party to $'s per visit for each visitor use segment
    - Expenditure per party by visitor use segment * Persons per vehicle by visitor use segment = Expenditure per visit (2001 dollars)
4. Convert from 2001 dollars to 2003 dollars (2003 is the IMPLAN model data year)
    - Expenditure per visit (2001 dollars) * (2003 GDP deflator / 2003 GDP deflator) = Expenditure per visit (2003 dollars)
5. Calculate total estimated expenditures for each visitor use segment
    - Wildlife related use by visitor use segment * Expenditure per visit = Total expenditure per wildlife related visitor use segment
    - Recreation related use by visitor use segment * Expenditure per visit = Total expenditure per recreation related visitor use segment
6. Calculate Labor Income and Employment estimates
    - Response coefficient for each wildlife related visitor use segment * (Total expenditure per wildlife related visitor segment / 1,000,000) = Labor Income or jobs supported.
    - Response coefficient for each recreation related visitor use segment * (Total expenditure per recreation related visitor segment / 1,000,000) = Labor Income or jobs supported.
7. Convert Labor Income estimates from 2003 dollars to 2006 dollars
    - Estimated wildlife related labor income * (2006 GDP deflator / 2003 GDP deflator) – Estimated wildlife related labor income in 2006 dollars.
    - Estimated recreation related labor income * (2006 GDP deflator / 2003 GDP deflator) – Estimated recreation related labor income in 2006 dollars.

Recreation Calculations for the Coronado National Forest:

1. Division of National Forest Visits between wildlife and recreation:
   - 2,296,000 National Forest Visits * 10% Wildlife Related = 229,600 wildlife related National Forest Visits
   - 2,296,000 National Forest Visits * 90% Recreation Related = 2,066,400 recreation related National Forest Visits

2. Calculation of visits by visitor use segments:

Use Segment	Total Visits		*Segment percentage	Recreation visits	Wildlife visits
	Recreation	Wildlife			
Non-Local day	2,066,400	229,600	7%	144,648	16,072
Non-Local overnight on forest			5%	103,320	11,480
Non-Local overnight off forest			9%	185,976	20,664
Local day			62%	1,281,168	142,352
Local overnight on forest			4%	82,656	9,184
Local overnight off forest			7%	144,648	16,072

*NOTE: percentages do not total to 100% because 6 percent of visitors indicated that the National Forest was not the primary reason for their presence.

3 and 4. Convert spending profiles from $'s per party to $'s per visit and convert to 2002 dollars:

Use Segment	Avg. persons per vehicle	Conversion: 1/Avg. person per vehicle	2002 GDP / 2001 GDP 1.1080 / 1.0940	Expenditure per Party	Expenditure per Visit (Expenditure per Party * Conversion * GDP)
WILDLIFE RELATED					
Non-Local day	2.3	0.434783	1.0128	$40.71	$17.926576
Non-Local overnight on forest	2.5	0.400000		$203.78	$82.555354
Non-Local overnight off forest	2.7	0.370370		$249.95	$93.758928
Local day	2.1	0.476190		$44.03	$21.235019
Local overnight on forest	2.5	0.400000		$151.92	$61.545830
Local overnight off forest	2.5	0.400000		$116.49	$47.192429
RECREATION RELATED					
Non-Local day	2.3	0.434783	1.0128	$53.76	$23.673120
Non-Local overnight on forest	2.5	0.400000		$151.33	$61.306810
Non-Local overnight off forest	2.7	0.370370		$244.46	$91.699571
Local day	2.1	0.476190		$30.79	$14.849562
Local overnight on forest	2.5	0.400000		$119.49	$48.407789
Local overnight off forest	2.5	0.400000		$116.03	$47.006074

5. Calculate total estimated expenditures for each visitor use segment:

Use Segment	Visits	2002 Expenditure per visit	Total Expenditure per Use Segment
WILDLIFE RELATED			
Non-Local day	16,072	$17.926508	$288,115
Non-Local overnight on forest	11,480	$82.555115	$947,733
Non-Local overnight off forest	20,664	$93.758751	$1,937,431
Local day	142,352	$21.234979	$3,022,842
Local overnight on forest	9,184	$61.545653	$565,235
Local overnight off forest	16,072	$47.192293	$758,475
TOTAL WILDLIFE RELATED			$7,519,830
RECREATION RELATED			
Non-Local day	144,648	$23.673031	$3,424,257
Non-Local overnight on forest	103,320	$61.306633	$6,334,201
Non-Local overnight off forest	185,976	$91.699397	$17,053,887
Local day	1,281,168	$14.849534	$19,024,748
Local overnight on forest	82,656	$48.407649	$4,001,183
Local overnight off forest	144,648	$47.005938	$6,799,315
TOTAL RECREATION VISITOR EXPENDITURES			$56,637,590
TOTAL WILDLIFE AND RECREATION VISITOR ESTIMATED EXPENDITURES			$64,157,420

6. Calculate Labor Income estimates:

Use Segment	Total Expenditure per Use Segment	Total Expenditure / 1,000,000	Labor Income Response Coeff.	Est. Labor Income (2002 $'s)	Jobs Response Coeff.	Est. Jobs
WILDLIFE RELATED						
Non-Local day	$288,115	0.288115	$505,837.75	$145,739	20.0	6
Non-Local overnight on forest	$947,733	0.947733	$516,437.02	$489,444	19.1	18
Non-Local overnight off forest	$1,937,431	1.937431	$506,203.60	$980,734	21.5	42
Local day	$3,022,842	3.022842	$490,969.14	$1,484,122	18.3	55
Local overnight on forest	$565,235	0.565235	$508,552.13	$287,452	17.7	10
Local overnight off forest	$758,475	0.748475	$518,601.69	$393,346	19.7	15
Total Wildlife Related Labor Income and Jobs				**$3,780,838**		**146**

Use Segment	Total Expenditure per Use Segment	Total Expenditure / 1,000,000	Labor Income Response Coeff.	Est. Labor Income (2002 $'s)	Jobs Response Coeff.	Est. Jobs
RECREATION RELATED						
Non-Local day	$3,424,257	3.424257	$505,837.75	$1,732,119	20.0	68
Non-Local overnight on forest	$6,334,201	6.3342010	$516,437.02	$3,271,216	19.1	121
Non-Local overnight off forest	$17,053,887	17.053887	$506,203.60	$8,632,746	21.5	367
Local day	$19,024,748	19.024748	$490,969.14	$9,340,561	18.3	348
Local overnight on forest	$4,001,183	4.001183	$508,552.13	$2,034,809	17.7	71
Local overnight off forest	$6,799,315	6.799315	$518,601.69	$3,526,138	19.7	134
Total Recreation Related Labor Income and Jobs				**$14,901,509**		**1,107**
TOTAL LABOR INCOME AND JOBS				**$28,537,590**		**1,253**

7. Convert Labor Income estimates from 2002 dollars to 2006 dollars:

Use Segment	Est. Labor Income (2002 $'s)	2006 GDP / 2002 GDP (1.1747 / 1.1080)	Est. Labor Income (2006 $'s)
WILDLIFE RELATED			
Non-Local day	$145,739	1.060199	$154,513
Non-Local overnight on forest	$489,444		$518,908
Non-Local overnight off forest	$980,734		$1,039,774
Local day	$1,484,122		$1,573,465
Local overnight on forest	$287,452		$304,756
Local overnight off forest	$393,346		$417,025
TOTAL WILDLIFE RELATED LABOR INCOME			$4,008,441
RECREATION RELATED			
Non-Local day	$3,424,257	1.060199	$1,836,391
Non-Local overnight on forest	$6,334,201		$3,468,140
Non-Local overnight off forest	$17,053,887		$9,152,429
Local day	$19,024,748		$9,902,854
Local overnight on forest	$4,001,183		$2,157,303
Local overnight off forest	$6,799,315		$3,738,408
TOTAL RECREATION RELATED LABOR INCOME			$30,255,524

GRAZING:

Grazing Data Needs:

- Forest Service Actual Head Months of Grazing for the year of IMPLAN data
  - 177,850 HM (2002)
  - Source: Coronado National Forest Range staff
- Total State cattle inventory
  - 1,706,000 animals (January 1 inventory + Calves + in-shipping)
  - Source: National Agricultural Statistics Service (2003)
- Total cattle inventory for each county in the analysis area
  - Graham County – 22,000 animals
  - Cochise County – 54,500 animals
  - Pima County – 24,000 animals
  - Pinal County – 23,000 animals
  - Source: National Agricultural Statistics Service (2003)
- Total state marketings
  - 812,000 animals
  - National Agricultural Statistics Service
- Total state gross income (from sale of cattle), 2002 data
  - $693,891,000
  - Source: National Agricultural Statistics Service (2003)
- Final Demand factor
  - 0.829755
  - Source: IMPLAN Model (reciprocal of type SAM multiplier), 2002 data year
- Response Coefficient (from IMPLAN model)
  - $214,604 of labor income and 13.3 jobs per $1,000,000 change in final demand
  - Source: IMPLAN Model, 2002 data year
- GDP deflation factors for 2003 and 2006
  - 2002 – 1.1080
  - 2003 – 1.1221
  - 2006 – 1.1747

Grazing Contribution Analysis Process:

1. Total state marketings / Total state inventory = State Proportion of cattle marketed
2. State gross income * (2002 GDP / 2003 GDP) [to convert state gross income from 2003 dollars to 2002 dollars which is the same as the IMPLAN model data]
3. State gross income / State total marketings = Price per animal
4. FS Head Months grazed / Total HM in Impact area (total of county inventories * 12) = Proportion FS HM.
5. Total of county inventories * State proportion of cattle marketed * Price per animal * Proportion FS HM = Total FS selling price
6. Change in final demand /1,000,000 * Response Coefficient = Economic Impact
7. Economic Impact * GDP Inflator = Economic impact in today's dollars.

Grazing Contribution Analysis Calculations:

1. 812,000 animals / 1,706,000 animal = 0.47596717
2. $693,891,000 * (1.1080/1.1221) = $685,171,757
3. $685,171,757/ 812,000 = $843.81
4. 177,850 HM / [(22,000 HM + 54,500 HM + 24,000 HM + 23,000) * 12] = 0.12000675
5. (22,000 HM + 54,500 HM + 24,000 HM + 23,000) * 0.47596717 * $843.81 * 0. 12000675 = $5,952,412.96
6. $5,952,412.96/ 1,000,000 * $214,604 = $1,277,411.63 Labor Income (2002 dollars)

   $4,939,232 / 1,000,000 * 13.3 = 79 Jobs
7. $1,277,411.63 * (1.1747 / 1.1080) = $1,354,310 Labor Income (2006 dollars)

NOTE: The calculations above were completed in a Microsoft Excel Workbook referred to as FEAST. If they are recalculated based on the numbers displayed – slightly different answers may be obtained than were displayed in the Coronado National Forest Economic and Social Sustainability report due to the effects of rounding.

ERRATA

October 18, 2008

During the course of prepare the preceding process paper, errors were discovered in the process of reconstructing and documenting the analysis process. A summary of the errors discovered follows:

- In calculating the total grazing in the analysis area, incorrect county cattle inventories were used, resulting in incorrect analysis area inventory numbers.

- The FEAST spreadsheet is used for economic analyses agency-wide. As a result numerous economists have reviewed its calculations and results over the years. Occasionally, calculation errors are discovered and corrected or revised processes adopted. One such change occurred in the grazing portion of FEAST since the original analysis. An incorrect formula in the string of calculations resulted in skipping one step – the adjustment of total output to removed inter-industry uses and isolate final demand. (Inter-industry demand is the products that the grazing industry buys from each other and uses to produce the final product. These purchases must be eliminated in order to calculate the true final demand.)

- County and state cattle inventories have been revised by the National Agricultural Statistics Service (NASS) in the years since the original analysis was conducted.

The calculations presented in the preceding process paper accurately describe how the grazing contribution was calculated in the original Economic Conditions and Trends Report of November 2006. The following describes the corrected process and utilizes the revised county and state inventory numbers as currently published by the NASS.

GRAZING:

Grazing Data Needs (Corrected):

- Forest Service Actual Head Months of Grazing for the year of IMPLAN data
  - 177,850 HM (2002)
  - Source: Coronado National Forest Range staff
- 2003 Total State cattle inventory
  - Arizona:
    - 1,654,000 animals (January 1 inventory + Calves + in-shipping - deaths)
  - New Mexico:
    - 2,916,000 animals (January 1 inventory + Calves + in-shipping - deaths)
  - Source: National Agricultural Statistics Service (2008)
- 2003 Total cattle inventory for each county in the analysis area
  - Arizona:
    - Graham County – 37,772 animals
    - Cochise County – 137,170 animals
    - Pima County – 51,687 animals
    - Pinal County – 477,114 animals
    - Santa Cruz County – 23,856 animals
  - New Mexico:
    - Hidalgo County – 49,259 animals
  - Source: National Agricultural Statistics Service (2008)
- 2003 Total state marketings
  - Arizona:
    - 793,000 animals
  - New Mexico:
    - 1,404,000 animals
  - National Agricultural Statistics Service (2008)
- 2003 Total state gross income (from sale of cattle), 2002 data
  - Arizona:
    - $752,294,000
  - Arizona:
    - $760,635,000
  - Source: National Agricultural Statistics Service (2008)
- Final Demand factor
  - 0.829755
  - Source: IMPLAN Model (reciprocal of type SAM multiplier), 2002 data year
- Response Coefficient (from IMPLAN model)
  - $214,604 of labor income and 13.3 jobs per $1,000,000 change in final demand
  - Source: IMPLAN Model, 2002 data year

- GDP deflation factors for 2003 and 2006
    - 2002 – 1.1080
    - 2003 – 1.1221
    - 2006 – 1.1747

Grazing Contribution Analysis Process (Corrected):

1. Total of Arizona Counties / Total of all counties = Percentage of Study Area Animals in Arizona
   Total of New Mexico Counties / Total of all counties = Percent of Study Area Animals in New Mexico

2. Arizona Total Inventory * Proportion of Study Area in Arizona = Arizona Portion Total Inventory
   New Mexico Total Inventory * Proportion of Study Area in New Mexico = New Mexico Portion Total Inventory

3. Arizona Portion Total Inventory + New Mexico Portion Total Inventory = Total Inventory

4. Arizona Marketings * Proportion of Study Area in Arizona = Arizona Portion Marketings
   New Mexico Marketings * Proportion of Study Area in New Mexico = New Mexico Portion Marketings

5. Arizona Portion Marketings + New Mexico Portion Marketings = Total Marketings

6. Arizona Gross Income * Proportion of Study Area in Arizona = Arizona Portion Gross Income
   New Mexico Gross Income * Proportion of Study Area in New Mexico = New Mexico Portion Gross Income

7. Arizona Portion Gross Income + New Mexico Portion Gross Income = Total Gross Income

8. Total marketings / Total inventory = Proportion of cattle marketed

9. Total gross income * (2002 GDP / 2003 GDP) [to convert state gross income from 2003 dollars to 2002 dollars which is the same as the IMPLAN model data]

10. Total gross income / Total marketings = Price per animal

11. FS Head Months grazed / Total HM in Impact area (total of county inventories * 12) = Proportion FS HM.

12. Total of county inventories * Proportion of cattle marketed * Price per animal * Proportion FS HM = Change in Total Industrial Output (TIO)

13. Change in TIO * Final Demand Factor = Change in Final Demand

    - Final Demand Factor is used to adjust the output to remove intermediate demand (demand of cattle producers from other cattle producers) so that we are left with the change in Final Demand.

14. Change in Final Demand /1,000,000 * Response Coefficient = Economic Impact

15. Economic Impact * GDP Inflator = Economic impact in today's dollars.

Grazing Contribution Analysis Calculations (Corrected):

1. 727,599 animals / 776,858 animals = 93.659% of study area animals in Arizona
   49,259 animals / 776,858 animals = 6.340% of study area animals in New Mexico

2. 1,654,900 animals * 93.659% = 1,549,123 animals Arizona Inventory
   2,916,000 animals * 6.340% = 184,897 animals New Mexico Inventory

3. 1,549,123 animals Arizona + 184,897 animals New Mexico = 1,734,020 animals Total Inventory

4. 793,000 animals * 93.659% = 742,717 animals Arizona Marketings
   49,259 animals * 6.340% = 89,025 animals New Mexico Marketings

5. 742,717 animals Arizona Marketings + 89,025 animals New Mexico Marketings = 831,742 Total Marketings

6. $752.294,000 * 93.659% = $704,592,557 Gross Income Arizona
   $760,635,000 * 6.340% = $48,230,329 Gross Income New Mexico

7. $704,592,557 Gross Income Arizona + $48,230,329 Gross Income New Mexico = $752,822,886 Total Gross Income

8. 831,742 Total Marketings / 1,734,020 animals Total Inventory = 0.479661

9. $752,822,886 Total Gross Income * (1.1080/1.1221) = $743,363,121

10. $743,363,121 / 831,742 Total Marketings = $905.187 per animal

11. 177,850 HM / [(37,772 animals + 137,170 animals + 51,687 animals + 477,114 animals + 23,856 animals + 49,259 animals) * 12] = 0.01907792 Proportions FS HM in study area

12. (37,772 animals + 137,170 animals + 51,687 animals + 477,114 animals + 23,856 animals + 49,259 animals) * 0.479661 * $905.187 * 0. 01907792 = $6,434,953 Change in TIO

13. $6,434,953 Change in TIO * 0. 829755 = $5,339,434 Total change in Final Demand

14. $5,339,434 / 1,000,000 * $214,604 = $1,145,864 Labor Income (2002 dollars)

    $5,339,434 / 1,000,000 * 13.3 = 71 Jobs

15. $1,145,864 * (1.1747 / 1.1080) = $1,214,843 Labor Income (2006 dollars)

Summary:

Labor Income Supported by Grazing (2006 dollars): $1,214,843

Job Supported by Grazing: 71 jobs