

Coconino National Forest Plan Revision

Socioeconomic Resource Report

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for:
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Preface

The information in this specialist report reflects analysis that was completed prior to and in conjunction with the completion of the Draft Environmental Impact Statement (DEIS) for the revision of the 1987 Coconino National Forest Land Management Plan (the Plan). The primary purpose of specialist reports associated with the DEIS is to provide detailed information to assist in the preparation of the DEIS. As the DEIS was prepared, review-driven edits to the broader DEIS resulted in modifications to some of the information contained in some of the specialist reports. As a result, some reports no longer contain information and analysis that was updated through an interdisciplinary review process and is included in the DEIS in its entirety. This is a complete specialist report which includes all the information that was summarized in the DEIS and other supplemental information. Efforts have been made to ensure that the retained information in the specialist reports is consistent with the DEIS. If inconsistencies exist between specialist reports and the DEIS, the DEIS should be regarded as the most current, accurate source of analysis.

Table of Contents

Introduction	1
Study Area.....	1
Affected Environment	1
Population and Demographics	1
Population Growth.....	1
Population Density	2
Age and Gender	3
Educational Attainment	4
Forest Visitors	5
Environmental Justice	6
Employment and Income	8
Per Capita Income	8
Median Earnings.....	9
Non-Labor Income	9
Unemployment	10
Housing	11
Economic Diversity	12
Payments to States and Counties	15
Non-Market Values.....	15
Environmental Consequences	16
Methodology and Assumptions.....	16
Data Sources.....	16
Assumptions	16
Summary of Effects	17
Economic Impact Analysis.....	17
Financial Efficiency Analysis.....	19
Social Consequences	21
Effects Common to All Alternatives.....	22
Alternative A: No Action	23
Direct and Indirect Effects.....	23
Alternative B: Proposed Alternative	24
Direct and Indirect Effects.....	24
Alternative C	25
Direct and Indirect Effects.....	25
Alternative D.....	25
Direct and Indirect Effects.....	25
Cumulative Effects – All Alternatives	26
References	28
Appendix A: Race and Ethnicity Breakdown.....	30

List of Figures

Figure 1: Race and Ethnicity	7
Figure 2: Annual Unemployment Rate, 2001-2010	11
Figure 3: Employment by Industry in the Study Area.....	13
Figure 4: Employment Specialization in the Study Area	14

List of Tables

Table 1: Population Change, 1990-2000 and 2000-2010	2
Table 2: Population Density	2
Table 3: Median Age	3
Table 4: Gender Distribution.....	4
Table 5: Educational Attainment, Percent of Persons Age 25+	4
Table 6: Forest Activity Participation	5
Table 7: Percent of Persons Living in Poverty	8
Table 8: Per Capita Income, 2009 US Dollars	9
Table 9: Median Earnings for Workers, 2009 US Dollars	9
Table 10: Contribution of Labor and Non-Labor Income to Total Personal Income, 2000 and 2009	10
Table 11: Median Value of Owner-Occupied Homes, 2009 US Dollars	11
Table 12: Payments to States and Counties from the Coconino National Forest.....	15
Table 13: Employment by Program Area, by Alternative.....	17
Table 14: Labor Income by Program Area, by Alternative.....	18
Table 15: Estimated Annual Forest Product Volumes, by Alternative	19
Table 16: Annual Coconino NF Program Expenditures, by Alternative.....	19
Table 17: Annual Coconino NF Program Revenue by Alternative.....	20
Table 18: Present Net Value (PNV)* by Alternative and Program Area (15-year Period).....	20
Table 19: Wilderness-Related Values, Acres by Alternative	22
Table 20: Race and Ethnicity in the Study Area	30

Introduction

The Coconino National Forest (Coconino NF) is currently revising its 1987 forest plan, as amended (1987 plan). The 2000 National Forest System Land and Resource Management Planning Rule (2000 rule) guides the revision effort for the Coconino NF. The Forest Service, U.S. Department of Agriculture (Forest Service) is following the provisions of the 1982 National Forest System Land and Resource Management Planning Rule (1982 rule) through the 2000 rule transition language (36 CFR 219.35(b)). This report provides social and economic analysis in partial fulfillment of the Environmental Impact Statement (EIS) component of the 1982 rule.

Study Area

The Coconino NF extends into three counties – Coconino, Gila, and Yavapai. However, less than one-third of one percent of the Coconino NF is in Gila County. As a result, Gila County will not be included in the social and economic analysis. In addition, Maricopa County will be included in the study area due to the social and economic linkages between residents of Maricopa County (particularly the Phoenix metropolitan area) and the Coconino NF. A number of day use recreation visits originate in Maricopa County and firms in the county process materials from the Coconino NF (e.g., timber and minerals). The size of Maricopa County could easily dominate the data. Therefore, to the extent practicable, social and economic data will be presented in a disaggregated (county-level) form.

Affected Environment

Existing social and economic conditions are necessary to establish the baseline from which to estimate potential consequences of Forest Service management actions. The proceeding section analyzes the current conditions and trends related to the social and economic environment of the planning area, including: population and demographic changes, potential environmental justice populations, and local economic conditions.

Population and Demographics

This section highlights population and demographic trends in the study area. Population is an important consideration in managing natural resources. In particular, population structure (size, composition, density, etc.) and population dynamics (how the structure changes over time) are essential to describing the consequences of forest management and planning on a social environment (Seesholtz et al. 2004). Population increases may lead to conflicts over land use, travel management, recreation activities, and values. These are conflicts that Forest Service managers attempt to balance when making management decisions.

Population Growth

The study area is home to 4,162,571 people (U.S. Census Bureau 2010). Table 1 displays population data for the counties, state, and nation in 1990, 2000, and 2010.

Table 1: Population Change, 1990-2000 and 2000-2010

	<i>1990</i>	<i>2000</i>	<i>% Growth, 1990-2000</i>	<i>2010</i>	<i>% Growth, 2000-2010</i>
<i>Coconino County</i>	96,591	116,320	20.4%	134,421	15.6%
<i>Maricopa County</i>	2,122,101	3,072,149	44.8%	3,817,117	24.2%
<i>Yavapai County</i>	107,714	167,517	55.5%	211,033	26.0%
<i>Study Area Total</i>	2,326,406	3,355,986	44.3%	4,162,571	24.0%
<i>Arizona</i>	3,665,228	5,130,632	40.0%	6,392,017	24.6%
<i>United States</i>	248,709,873	281,421,906	13.2%	308,745,538	9.7%

Source: U.S. Census Bureau, 1990, 2000, and 2010

Maricopa County is by far the largest county in the study area. Maricopa County alone accounts for approximately 60 percent of Arizona's population. As a result, the study area totals are dominated by Maricopa County. These data highlight the importance of presenting socioeconomic information at a county-level; otherwise, the inclusion of Maricopa County could mask substantial changes in other counties.

The study area population growth rate mirrored Arizona's population growth rate during the two periods. However, the growth rates varied between study area counties. The population in Maricopa and Yavapai counties grew at approximately double the rate of Coconino County. Regardless, all study area counties surpassed the national population growth rate in both periods.

Rapid population growth may signal expanding economic opportunities and/or desirable amenities. Much of Coconino, Maricopa, and Yavapai counties are occupied by protected federal lands. National Forest System and Department of Interior (DOI) lands provide natural amenities for area residents.

Population Density

Population density can serve as an indicator of a number of socioeconomic factors of interest – urbanization, availability of open space, socioeconomic diversity, and civic infrastructure (Horne and Hayes 1999). More densely populated areas are generally more urban, diverse, and offer better access to infrastructure. In contrast, less densely populated areas provide more open space, which may offer natural amenity values to residents and visitors. Table 2 displays the number of people per square mile for each of the counties of interest.

Table 2: Population Density

	<i>People/Sq. Mile</i>
<i>Coconino County</i>	7.2
<i>Maricopa County</i>	414.8
<i>Yavapai County</i>	26.0
<i>Arizona</i>	56.3
<i>United States</i>	86.6

Source: U.S. Census Bureau 2010

Despite substantial gains in population since 1990, both Coconino and Yavapai counties continue to have relatively low population density in part because of the large areas of National Forest System, Department of Interior, and tribal lands. Both counties are less dense than the state and nation. In contrast, Maricopa County is much more dense than the state and nation, with more than 400 people per square mile in the county.

These findings suggest that the study area, outside of the Phoenix metropolitan area, is quite rural. However, the population is not evenly distributed within counties. Much of the population in Coconino and Yavapai counties is concentrated in more urban areas – the Flagstaff metropolitan area in Coconino County and the Prescott metropolitan area in Yavapai County.

Low population density points to high levels of public ownership. In all of the Arizona counties included in the analysis, a minority of the land is privately owned. Maricopa County has the highest private ownership rate, at 29 percent, but the majority of land is publicly owned (Forest Service, BLM, and State Lands) or Indian reservation land (Arizona Department of Commerce 2008).

Age and Gender

Table 3 lists the median age by county for the study area. As with other population characteristics, the median age varies substantially between counties. Coconino and Maricopa counties are relatively young with median ages below the state and national medians. In contrast, Yavapai County exceeds the state and national median ages by nearly a decade. A high median age generally indicates that a relatively large number of retirees reside in the area. An area with a large percentage of retirees will earn income primarily from investments and transfer payments (e.g., dividends and Social Security), rather than salaries and wages.¹

Table 3: Median Age

	<i>Median Age</i>
<i>Coconino County</i>	31.8
<i>Maricopa County</i>	33.3
<i>Yavapai County</i>	44.5
<i>Arizona</i>	35.1
<i>United States</i>	36.8

Source: U.S. Census Bureau 2008

Age data may be relevant for forest management decisions. A population's age may affect community values and uses associated with forest lands. For example, older populations are more likely to desire easily accessible recreation opportunities.

Gender disparities in counties (i.e., deviations from a 50/50 split) may have numerous explanations, including: (1) the significant presence of an industry that is often dominated by one gender – e.g., forestry or mining; (2) a large number of single-parent households; (3) a large retiree population, which due to differences in life expectancy, often leads to a higher concentration of women; and (4) a combination of the above and other unnamed factors.

¹ This prediction is borne out in the non-labor income data presented in Table 10. More than 50 percent of the income in Yavapai County comes from non-labor sources.

Table 4 displays the gender breakdown for the study area counties, the state, and the nation. None of the counties markedly deviate from state and national conditions in terms of gender distribution.

Table 4: Gender Distribution

	<i>Females (% Total Population)</i>	<i>Males (% Total Population)</i>
<i>Coconino County</i>	50.1	49.9
<i>Maricopa County</i>	49.6	50.4
<i>Yavapai County</i>	50.9	49.1
<i>Arizona</i>	49.9	50.1
<i>United States</i>	50.7	49.3

Source: U.S. Census Bureau 2008

Educational Attainment

Educational attainment, the measure of people with at least a high school diploma or bachelor's degree, is an important indicator of an area's social and economic opportunities and its ability to adapt to change. Table 5 lists the percentage of the adult population with at least a high school diploma and a bachelor's degree.

Table 5: Educational Attainment, Percent of Persons Age 25+

	<i>High School Graduate</i>	<i>Bachelor's Degree or Higher</i>
<i>Coconino County</i>	86.1%	30.1%
<i>Maricopa County</i>	84.3%	27.5%
<i>Yavapai County</i>	88.7%	23.9%
<i>Arizona</i>	83.9%	25.7%
<i>United States</i>	84.6%	27.5%

Source: U.S. Census Bureau 2009

The vast majority of adult residents in the study area are high school graduates. Approximately a quarter of study area residents have a bachelor's degree or higher. The study area, state, and nation all have similar percentages of residents with a bachelor's degree or higher. These findings suggest that the study area is relatively well-educated. Opportunities likely exist for working-age adults with high levels of education. The presence of highly educated adults may be self-reinforcing: a highly educated population is a signal that an area provides economic and cultural opportunities, which attracts additional college educated adults to the area. This process leads to further economic development and job creation. In contrast, areas with low levels of educational attainment have lower levels of human capital, which reduces an area's ability to capitalize on economic change (Florida 2002).

There are a number of institutions of higher education in the study area, including Arizona State University and Northern Arizona University. Post-secondary institutions improve a county's ability to retain and attract young residents. In areas without higher educational opportunities, young people who wish to continue their education migrate out of the area – a process known as the “brain drain.”

Forest Visitors

Table 6 reports Coconino NF activity participation. Viewing natural features, hiking/walking, viewing wildlife, relaxing, and driving for pleasure are activities in which more than half of Coconino NF visitors engage. Hiking/walking is the most common main activity (i.e., the primary purpose of the Forest visit), followed by viewing natural features, relaxing, and driving for pleasure.

These findings suggest that Coconino NF visitors engage in a diverse range of activities, including both motorized and non-motorized uses in developed and undeveloped areas.

Table 6: Forest Activity Participation

Activity	% Participating	% as Main Activity	# Respondents as Main Activity	AVG HOURS DOING MAIN ACTIVITY
Developed Camping	4.4	1.5	85	42.5
Primitive Camping	4.2	1.8	15	23.0
Backpacking	1.7	0.4	8	24.1
Resort Use	0.8	0.0	3	45.2
Picnicking	14.8	1.9	43	2.8
Viewing Natural Features	84.2	21.5	399	6.4
Visiting Historic Sites	30.9	4.4	71	2.1
Nature Center Activities	20.7	0.0	1	4.0
Nature Study	18.2	0.2	7	3.4
Relaxing	60.2	8.1	245	12.2
Fishing	5.8	2.5	39	6.2
Hunting	2.1	1.7	10	19.9
OHV Use	5.6	0.9	11	2.7
Driving for Pleasure	51.3	6.1	86	2.8
Snowmobiling	0.0	0.0	1	4.4
Motorized Water Activities	2.6	1.6	18	3.6
Other Motorized Activity	0.4	0.0	0	.
Hiking / Walking	71.2	32.8	780	3.1
Horesback Riding	0.9	0.0	1	4.0
Bicycling	5.7	3.3	35	2.6
Non-motorized Water	0.6	0.2	8	4.8

Activity	% Participating	% as Main Activity	# Respondents as Main Activity	AVG HOURS DOING MAIN ACTIVITY
Downhill Skiing	4.4	4.2	374	6.1
Cross-country Skiing	0.2	0.1	8	7.6
Other Non-motorized	7.7	3.1	91	2.8
Gathering Forest Products	2.8	0.1	2	3.4
Viewing Wildlife	63.9	2.3	36	4.1
Motorized Trail Activity	5.4	1.1	8	3.8
Some Other Activity	9.4	1.8	45	2.6
No Activity Reported	0.0	0.1	4	.

Source: USFS 2011a

Environmental Justice

In 1994, President Clinton issued Executive Order (EO) 12898. This order directs federal agencies to focus attention on the human health and environmental conditions in minority and low-income communities. The purpose of EO 12898 is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations.

Environmental justice (EJ) is the fair treatment and meaningful involvement of people of all races, cultures, and incomes, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The goal of environmental justice is for Federal agency decisionmakers to identify impacts that are disproportionately high and adverse with respect to minority and low-income populations and identify alternatives that will avoid or mitigate those impacts. According to USDA DR5600-002 (USDA 1997), EJ, minority, minority population, low-income, and human health and environmental effects, are defined as follows:

Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment.

Minority means a person who is a member of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.

Minority Population means any readily identifiable group of minority persons who live in geographic proximity to, and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who will be similarly affected by USDA programs or activities.

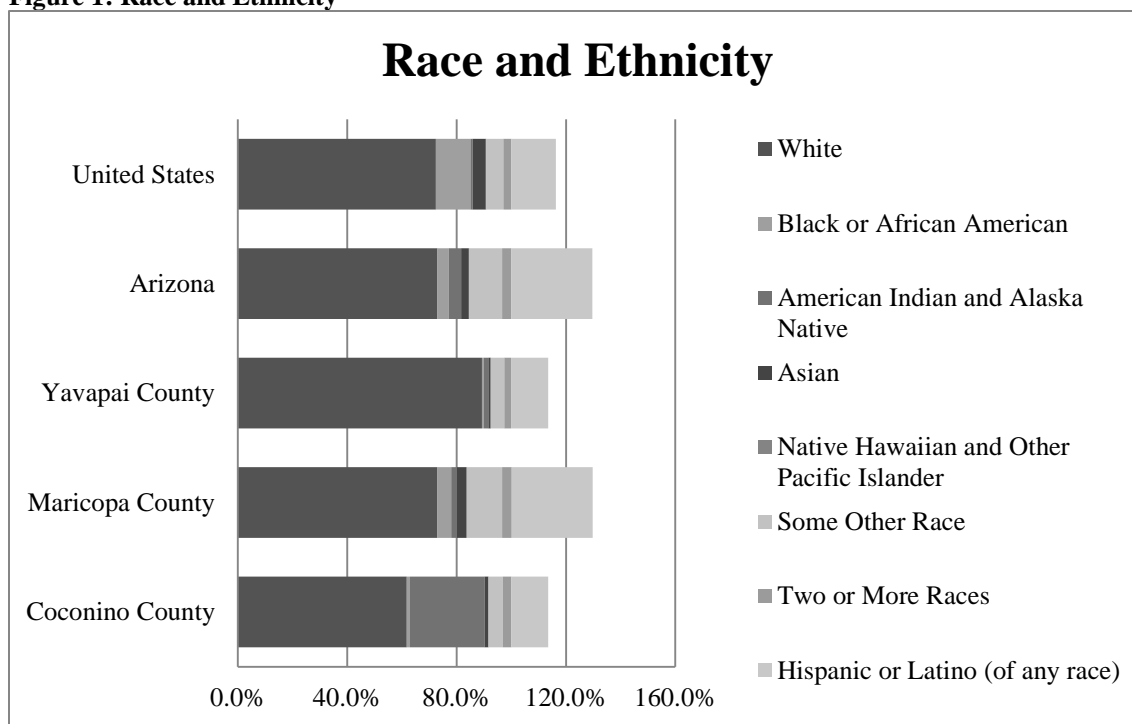
Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity to, and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who will be similarly affected by USDA programs or activities. Low-income populations may be identified using data collected, maintained and analyzed by an agency or from analytical tools such as the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty.

Human Health and/or Environmental Effects as used in this Departmental Regulation includes interrelated social and economic effects.

The emphasis of environmental justice is on health effects and/or the benefits of a healthy environment. The CEQ has interpreted health effects with a broad definition: "Such effects may include ecological, cultural, human health, economic or social impacts on minority communities, low-income communities or Indian Tribes ...when those impacts are interrelated to impacts on the natural or physical environment" (CEQ 1997).

According to the U.S. Census Bureau (2010) data reported in Figure 1, study area counties differ substantially in their racial and ethnic composition. For additional clarity, Table 20 in Appendix A: Race and Ethnicity Breakdown provides the data in tabular format.

Figure 1: Race and Ethnicity



Source: U.S. Census Bureau 2010

Coconino County has a high concentration of American Indian residents, due to the presence of five reservations in the county.² Maricopa County has the highest proportion of Hispanic/Latino residents in the study area, although it is equivalent to Arizona's proportion (29.6 percent). In contrast, Yavapai County is less diverse than both the state and nation. Approximately 90 percent

² Coconino County contains all or part of the Navajo Indian Reservation, Hualapai Indian Reservation, Hopi Indian Reservation, Havasupai Indian Reservation, and Kaibab Indian Reservation.

of Yavapai County residents are white. As a result, environmental justice issues are more likely to occur in Coconino and Maricopa counties than Yavapai County. However, a finding of low racial/ethnic diversity does not eliminate the need to consider potential disproportionate impacts of Forest Service management actions. A county may have a low overall concentration of minority residents, but still have areas with a high concentration of minority residents who could be adversely affected by management actions.

Table 7 reports the percentage of residents living in poverty. Maricopa and Yavapai counties have low poverty rates relative to the state. Coconino County has the highest poverty rate in the study area, above both the state and national rates.

Table 7: Percent of Persons Living in Poverty

	<i>Poverty Rate (%)</i>
<i>Coconino County</i>	17.4
<i>Maricopa County</i>	13.4
<i>Yavapai County</i>	12.7
<i>Arizona</i>	14.7
<i>United States</i>	13.5

Source: U.S. Census Bureau 2009

The incidence of poverty in Coconino County is not evenly distributed among racial and ethnic groups. Approximately 50 percent of American Indian residents in Coconino County live in poverty (U.S. Census Bureau 2000). The high proportion of American Indian residents in the county, therefore, increases the poverty rate relative to other study area counties and the state.

Based on the minority status and poverty data presented above, Coconino County appears most at risk for environmental justice issues. The largest minority group in the county – American Indians – also experience a very high poverty rate. Furthermore, Coconino County contains the most acreage of the Coconino NF, which suggests that the consequences of management actions will be felt most acutely by Coconino County residents. These conditions underscore the importance of evaluating environmental justice consequences. The potential for disproportionate adverse impacts on minority and low-income individuals will be evaluated in all study area counties.

Employment and Income

The previous section assessed demographic trends in the study area relative to the state and national averages. This section will focus on economic conditions and trends. This discussion provides additional information on the social and economic environment in the study area.

Per Capita Income

Per capita income is a key indicator of the economic well-being of a county. High per capita income may be a signal of greater job opportunities, highly skilled residents, greater economic resiliency, and well-developed infrastructure. Table 8 provides data on per capita income in 2009 for the counties, state, and nation.

Table 8: Per Capita Income, 2009 US Dollars

	<i>Per Capita Income</i>
<i>Coconino County</i>	\$22,238
<i>Maricopa County</i>	\$27,185
<i>Yavapai County</i>	\$25,458
<i>Arizona</i>	\$25,203
<i>United States</i>	\$27,041

Source: U.S. Census Bureau 2009

Per capita income in the study area is similar to per capita income in the state and nation. Coconino County has the lowest per capita income among the study area counties, which is consistent with the finding in the Environmental Justice section that Coconino County has a relatively high poverty rate.

Median Earnings

Per capita income offers an incomplete picture of the economic well-being of an area. Table 9 presents data on median earnings for workers. Whereas per capita income considers all sources of income (including wage and salary payments, transfer payments, investment earnings, dividends, and rents), median earnings considers only wage and salary earnings.

Table 9: Median Earnings for Workers, 2009 US Dollars

	<i>Median Earnings</i>
<i>Coconino County</i>	\$23,391
<i>Maricopa County</i>	\$31,011
<i>Yavapai County</i>	\$24,372
<i>Arizona</i>	\$28,748
<i>United States</i>	\$29,050

Source: U.S. Census Bureau 2009

Median earnings in Coconino and Yavapai counties are below state and national medians. Maricopa County has slightly higher median earnings than either the state or nation, indicating that Maricopa County offers relatively high-paying employment.

Median earnings are higher than per capita income in Coconino and Maricopa counties, which suggests that employed residents of these counties have slightly higher incomes than individuals who do not derive income from employment (e.g., retirees). In contrast, median earnings are lower than per capita income in Yavapai County, which suggests that retirees have higher incomes than workers in the county.

Non-Labor Income

Table 10 displays the role of labor and non-labor income in total personal income for 2000 and 2009. Non-labor income is any income derived from investments, dividends, rents, or transfer payments. In contrast, labor income is salary and wage disbursements from employment. During

the past decade, the percentage of total income derived from non-labor sources increased in all considered areas.

Non-labor income is not directly tied to employment; therefore, it can be more resistant to economic downturns. However, as the most recent recession demonstrated, asset markets can be quite volatile, and non-labor income that depends on investment returns may be unstable.

An increase in non-labor income may reflect changing demographic characteristics. Older populations rely largely on non-labor income, including rents, dividends, and transfer payments (e.g., Social Security). High percentages of non-labor income likely indicate higher concentrations of retirees.

Table 10: Contribution of Labor and Non-Labor Income to Total Personal Income, 2000 and 2009

	<i>2000</i>		<i>2009</i>	
	<i>Labor %</i>	<i>Non-Labor %</i>	<i>Labor %</i>	<i>Non-Labor %</i>
<i>Coconino County</i>	64%	36%	62%	38%
<i>Maricopa County</i>	72%	28%	66%	34%
<i>Yavapai County</i>	50%	50%	43%	57%
<i>Arizona</i>	68%	32%	62%	38%
<i>United States</i>	69%	31%	64%	36%

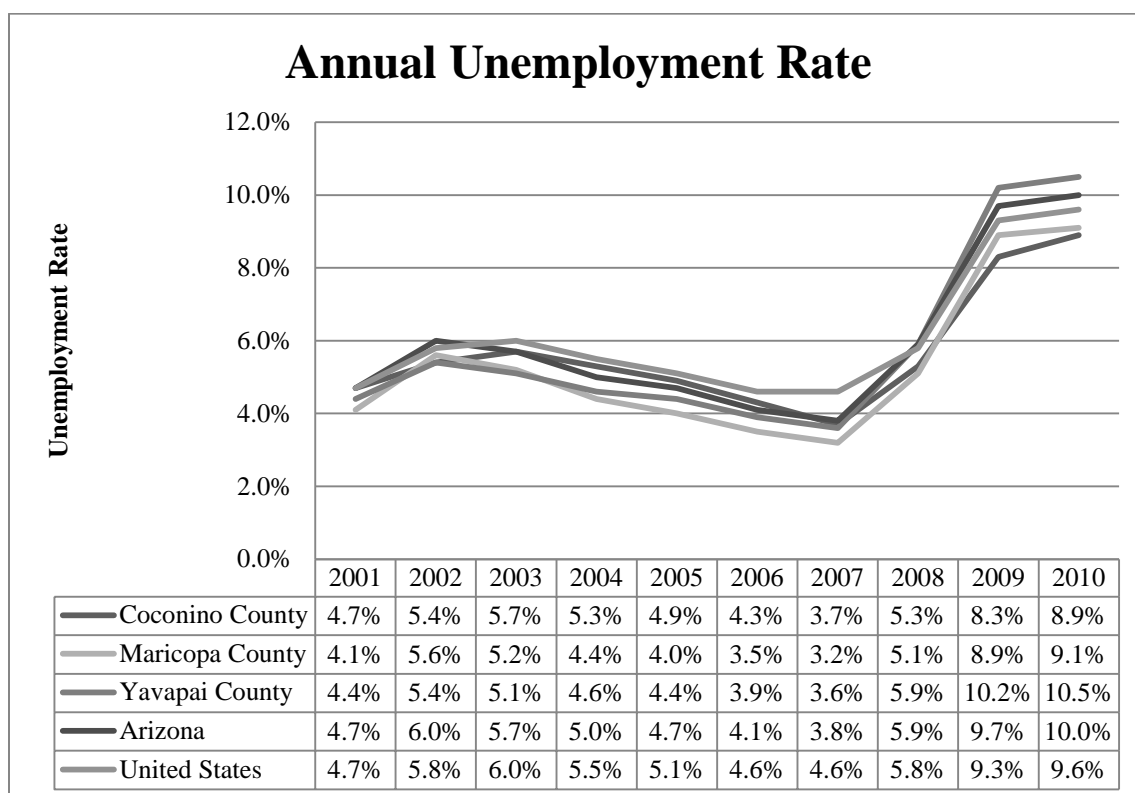
Source: U.S. Bureau of Economic Analysis 2011

Non-labor income dominates total personal income in Yavapai County, where it accounts for more than half of income. This finding is consistent with the median age data presented in Table 3, which showed that the median age in Yavapai County is approximately a decade older than the state and national medians.

The distribution of labor and non-labor income in Coconino and Maricopa counties mimics the state and national distributions.

Unemployment

The unemployment rate provides insight into the correspondence between residents' skills and employment opportunities. The "natural" rate of unemployment is said to be around 5%. This is the so-called "natural" rate because this is a level that allows for movement between jobs and industries, but does not signal broad economic distress. Recently, the national unemployment rate has hovered between 9% and 10%. Figure 2 provides the annual unemployment rates for the counties, state, and nation from 2001-2010.

Figure 2: Annual Unemployment Rate, 2001-2010

Source: U.S. Bureau of Labor Statistics 2011

Unemployment trends in the study area counties have mirrored state and national rates. This suggests that employment conditions in the study area are similar to broader state and national trends.

Housing

The above comparisons of per capita income and median earnings between the study area, states, and the nation are incomplete. Data on local cost of living offer additional context. Of the contributions to cost of living, housing costs are among the most substantial. Table 11 presents median home values in 2009.

Table 11: Median Value of Owner-Occupied Homes, 2009 US Dollars

	<i>Median Home Value</i>
Coconino County	\$254,700
Maricopa County	\$243,300
Yavapai County	\$232,700
Arizona	\$218,400
United States	\$185,400

Source: U.S. Census Bureau 2009

All study area counties have higher median home values than the state and nation. However, as Table 8 and Table 9 show, the study area counties do not have higher earnings or income than the

state or nation. Therefore, it is reasonable to suspect that study area residents spend a relatively high proportion of their income on housing expenses.

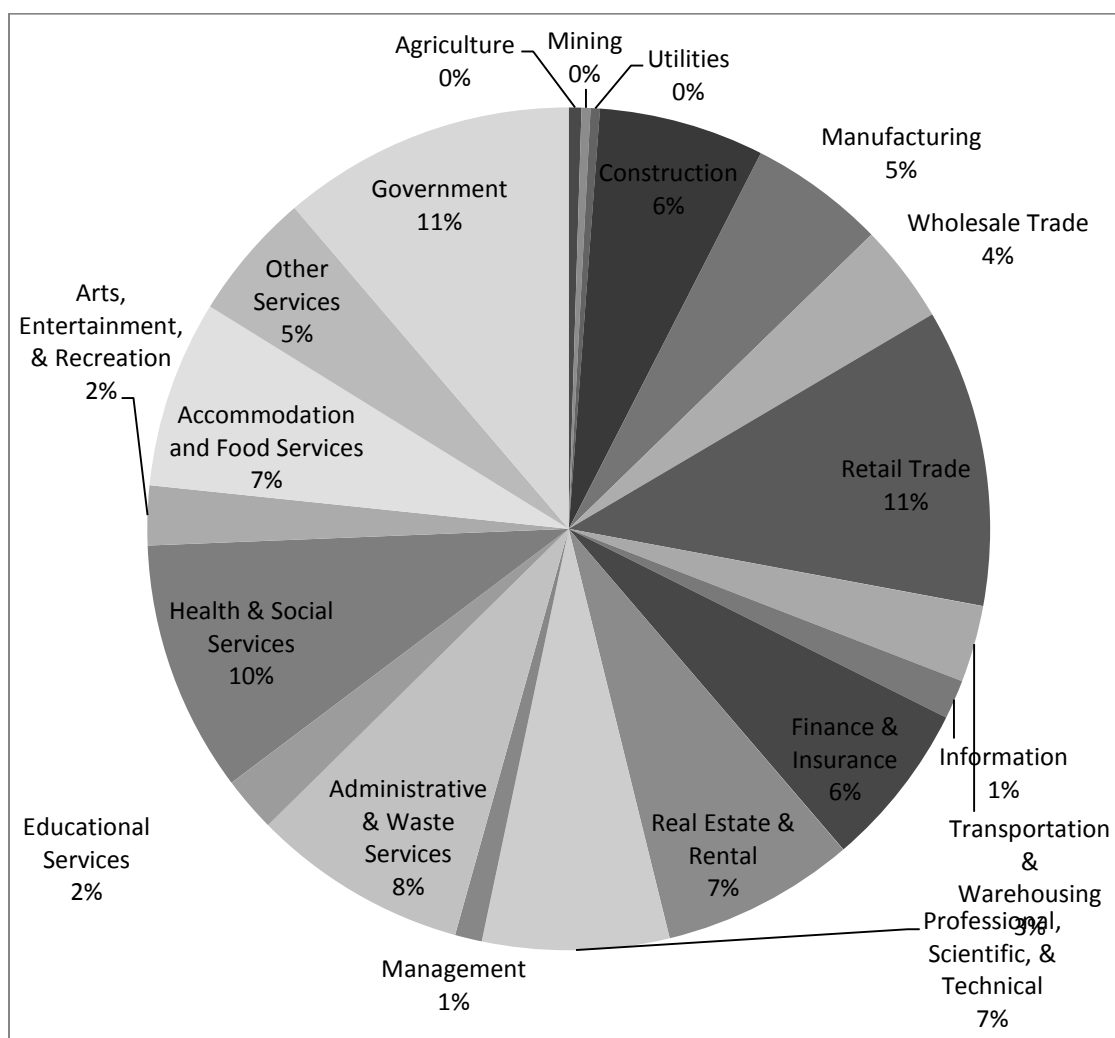
These data also imply that the study area is a desirable place to live. The natural amenities provided by the Coconino NF contribute to the attractiveness of the study area to new and existing residents.

Economic Diversity

Economic diversity generally promotes stability and greater employment opportunities. Highly specialized economies (i.e., those that depend on very few industries for the bulk of employment and income) are prone to cyclical fluctuations and offer more limited job opportunities.

Determining the degree of specialization in an economy is important for decisionmakers, particularly when the dominant industry can be affected by changes in policy. For Forest Service decisionmakers, this is likely to be the case where the forest products industry or the tourism and recreation industries, for instance, are reliant on the local forest(s).

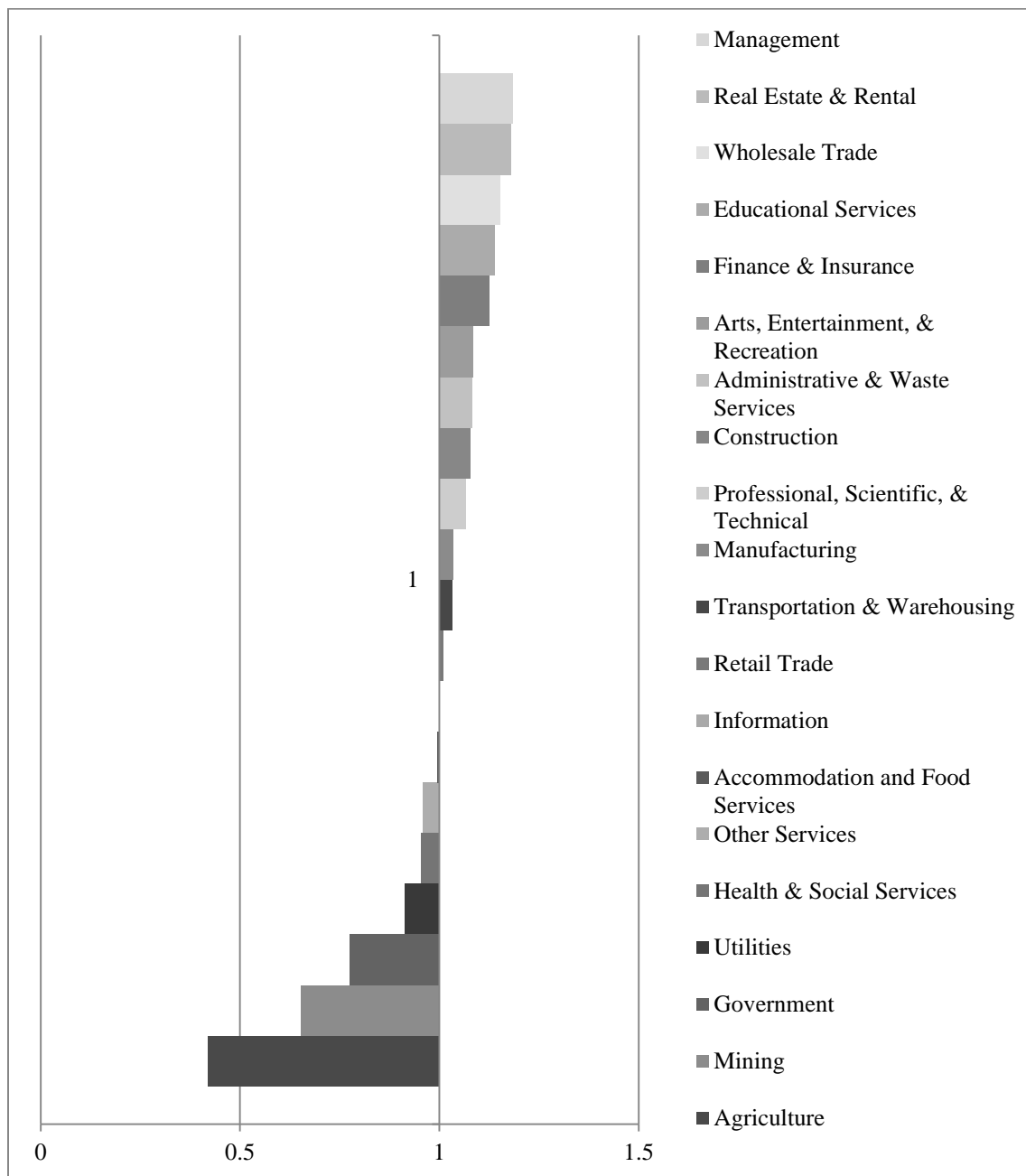
Figure 3 provides a breakdown of employment by industry in the study area. The study area economy is quite diverse, with no single sector dominating the local economy. This economic diversity is largely attributable to Maricopa County, which is the geographic and commercial center of the state. Government, retail trade, and the health and social services sectors are the largest employment sectors in the local economy. These industries are consistent with findings discussed in the demographic section – namely a substantial government presence due to public land management, a large retiree population that consumes health and social services, and amenities that attract tourists who contribute to the retail trade sector.

Figure 3: Employment by Industry in the Study Area

Source: MIG 2009

The Interior Columbia Basin Ecosystem Management Project identified communities that were specialized with respect to employment. This method is applied here using the ratio of the percent employment in each industry in the region of interest (study area) to an average percent of employment in that industry for a larger reference area (Arizona). For a given industry, when the percent employment in the analysis region is greater than in the reference area, local employment specialization exists in that industry (USFS 1998). Using this criterion applied with 2009 data, the study area can be characterized as specialized with respect to several industries, particularly management, real estate and rental, wholesale trade, and educational services (MIG 2009).

Figure 4 provides the employment specialization index for all industries in study area.

Figure 4: Employment Specialization in the Study Area

Source: MIG 2009

Whereas Figure 3 considers the study area in isolation, Figure 4 compares industry concentration in study area to the state as a whole. The numbers on the x-axis of Figure 4 show the degree of specialization in the local economy. A score of one indicates that the study area and the state are equally specialized in the sector. A score above one indicates that the study area is more specialized in the sector than the state. A score below one indicates that the study area is less specialized in the sector than the state. As the two figures demonstrate, these two methods of data analysis can suggest quite different results. Management accounts for just one percent of employment in the study area – a relatively modest figure until it is put in the context of the state. A resident of study area is more likely to be employed in the management sector compared to

residents of Arizona as a whole. Among specialized sectors in the study area, the educational services, arts, entertainment, and recreation, and professional, scientific, and technical services sectors particularly benefit from activities on the Coconino NF. Local and non-local visitors to the Coconino NF conduct transactions in the arts, entertainment, and recreation sector; special research areas on the Coconino NF contribute to employment in the educational services sector; and astronomic facilities on the Coconino NF support activities in the professional, scientific, and technical sector.

Although government employment accounts for a relatively large percentage of total employment in Figure 3, the study area is less specialized in government employment compared to the state. Public lands (National Forests, National Parks, BLM-managed public lands, and state-owned lands), military installations, and tribal lands are common across the state. All of these features contribute to a relatively large government presence in Arizona.

Payments to States and Counties

The Forest Service makes payments to states and counties that contain NFS lands. These payments fall into two categories: Payments in Lieu of Taxes (PILT) and Secure Rural Schools and Community Self-Determination Act payments (SRSCS).

Federal agencies do not pay property taxes; therefore, PILT is distributed to counties to compensate for the local services that support activities on federal lands. These services include law enforcement, road maintenance, and fire departments.

SRSCS payments are intended to improve public schools, maintain infrastructure, improve the health of watersheds and ecosystems, protect communities, and strengthen local economies.

Table 12 lists the PILT and SRSCS payments from the Coconino NF.

Table 12: Payments to States and Counties from the Coconino National Forest

	SRSCS (FY09)	PILT (FY10)	Total FS Payments
Coconino County	\$1,947,584	\$468,909	\$2,416,493
Gila County*	\$7,246	\$10,618	\$17,864
Yavapai County	\$638,513	\$142,113	\$780,625
Coconino NF	\$2,593,343	\$621,639	\$3,214,982

Source: USFS 2010 and DOI 2010

*Note: Gila County is included here to reflect total payments, however, the county will not be included in the impact analysis

Non-Market Values

Public lands have both market and non-market values. Market values include commodity uses of public land resources, such as timber and minerals. Market values are relatively easy to measure and the economic impact of marketed goods and services are captured in the economic input-output analysis that follows.

Non-market values, however, are more difficult to assess. Non-market values may arise from direct use of the resources (e.g., hunting for personal use and subsistence gathering) or from passive use (sometimes called non-use). Passive use captures the value of knowing that the resource(s) exist, whether or not future direct use is intended. Forest ecosystems provide numerous values that are often of direct use to humans, even if they are not recognized. Clean

water, climate regulation, and the research and educational opportunities that unique ecosystems afford are a few of the many ecosystem goods and services whose values are not recognized in traditional economic impact analysis.

Consistent with direction provided in 40 CFR 1502.23 and Forest Service Handbook 1909.15 (7/06/04) and 22.35 (01/14/05), the subsequent analysis of environmental consequences will consider non-market goods and services primarily in qualitative terms. Where appropriate, discussion of how the alternatives may affect non-market values will be presented. However, due to the qualitative nature of these discussions, direct comparisons between changes in market and non-market values are generally not possible.

Environmental Consequences

The previous sections assessed past and current social and economic conditions. The following section will consider the potential consequences of alternative management scenarios on the social and economic environment. Section 219.12(h) of the 1982 rule directs the planning team to “evaluate the significant physical, biological, economic, and social effects of each management alternative that is considered in detail. The evaluation shall include a comparative analysis of the aggregate effects of the management alternatives and shall compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources.” This section will partially fulfill the evaluation requirements. The Data Sources section below describes the economic impact financial efficiency, and social analysis procedures employed in this document.

Methodology and Assumptions

Data Sources

Economic impacts were modeled using IMPLAN Professional Version 3.0 and the Forest Economic Analysis Spreadsheet Tool (FEAST), with 2009 data. Data on use levels under each alternative were collected from the Coconino NF’s resource specialists. In most instances, the precise change is unknown. Therefore, the changes are based on the professional expertise of the resource specialists (1982 rule, 219.12(g)).

Financial efficiency analysis was conducted with QuickSilver Version 6. Data on program expenditures and revenues were provided by the Coconino NF resource specialists and budget staff (1982 rule, 219.12(e)).

Social impacts use the baseline social conditions presented in the Affected Environment section, National Visitor Use Monitoring (NVUM) profiles (USFS 2011a), and information from the Economic and Social Sustainability Assessment (USFS 2008) to discern the primary values that the Coconino NF provide to area residents and visitors. Social effects are based on the interaction of the identified values with estimated changes to resource availability and uses.

Assumptions

1. Information on the timing of costs and benefits was not available for the economic efficiency analysis. Furthermore, the analysis does not provide a full accounting of all costs and benefits. The only benefits considered are program revenues (i.e., Forest receipts). The only costs considered are direct Coconino NF expenditures.

2. The economic impact of grazing was estimated using authorized levels. However, actual use is permitted annually based on a number of factors, such as current forage and market conditions. For consistency, the analysis assumes that current market demand for livestock products would continue throughout the next several decades with a continuing demand for grazing of the forest lands.
3. Changes in use levels were estimated using professional judgment. However, actual changes in use are difficult to predict. Only minor changes in expected resource use levels and activities were predicated between alternatives.
4. Some of the value of forest management is not captured in market transactions. Non-market goods and services, such as clean air and scenic vistas, have economic values. However, the monetary values of such goods and services are generally unknown. As a result, it is difficult to analyze potential tradeoffs between market and non-market values. In general, management actions that promote Forest health will increase non-market values. For the purpose of this analysis, lands with wilderness-related values will be used as a proxy for non-market values.
5. The framework for the social analysis employs generalities. Area residents and Coconino NF visitors have diverse preferences and values that may not be fully captured in the description of social consequences. Nevertheless, the general categories are useful for assessing social impacts based on particular forest-related interests.
6. The potential consequences of implementation of the Four Forest Restoration Initiative (4FRI) are not considered in the social and economic analysis for the plan revision. The implementation of 4FRI is not contingent on the forest plan alternative selected. The consequences of 4FRI would affect all alternatives equally, therefore, its inclusion is not necessary to compare between alternatives. Furthermore, the consequences of 4FRI implementation are uncertain and dependent on numerous external factors. The consequences of 4FRI, particularly the second and third stages, are not reasonably foreseeable.

Summary of Effects

Economic Impact Analysis

Economic impact analysis estimates the employment and labor income consequences of forest management actions. The tables presented in this section will be referenced in the alternative-specific descriptions of economic impacts.

Table 13 provides employment estimates, by alternative. Recreation, timber, and Forest Service expenditures account for the vast majority of Coconino NF-related employment under all alternatives.

Table 13: Estimated employment by Program Area, by Alternative

	Number of Jobs Contributed			
	Alternative A	Alternative B	Alternative C	Alternative D
Recreation	2,781	2,781	2,803	2,781
Grazing	330	330	330	330
Minerals	2	2	2	2
Timber	886	2,007	2,007	2,007
Ecosystem Restoration	9	9	9	9

	Number of Jobs Contributed			
	Alternative A	Alternative B	Alternative C	Alternative D
Payments to States and Counties	56	56	56	56
FS Expenditures	508	508	508	508
TOTAL	4,573	5,693	5,716	5,693

Source: IMPLAN 2009

Under all alternatives, employment supported by activities on the Coconino NF would account for approximately 0.2 percent of area employment. The percent of area employment associated with the Coconino NF appears particularly small due to the inclusion of Maricopa County in the study area, which has a very large labor force. The dominance of Maricopa County may mask the economic importance of the Coconino NF in Coconino and Yavapai counties, which are much less populous.

The sectors with the most Coconino NF-related employment are: accommodation and food services; retail trade; arts, entertainment, and recreation; manufacturing; and agriculture. Most of these sectors are associated with the tourism economy, which is supported by the Coconino NF and other public lands in the study area.

Table 14 provides labor income estimates, by alternative. As with the employment estimates, recreation, timber, and Forest Service expenditures account for the majority of Coconino NF contributions to local economic activity.

Table 14: Estimated labor Income by Program Area, by Alternative

	Labor Income Contributed			
	Alternative A	Alternative B	Alternative C	Alternative D
Recreation	\$105,774,000	\$105,774,000	\$106,646,000	\$105,774,000
Grazing	\$5,278,000	\$5,278,000	\$5,278,000	\$5,278,000
Minerals	\$118,000	\$118,000	\$118,000	\$118,000
Timber	\$35,381,000	\$79,687,000	\$79,687,000	\$79,687,000
Ecosystem Restoration	\$313,000	\$313,000	\$313,000	\$313,000
Payments to States and Counties	\$2,796,000	\$2,796,000	\$2,796,000	\$2,796,000
FS Expenditures	\$24,681,000	\$24,681,000	\$24,681,000	\$24,681,000
TOTAL	\$174,341,000	\$218,646,000	\$219,519,000	\$218,646,000

Source: IMPLAN 2009

The labor income data show differences in income per job by program area. For instance, while each recreation and timber-related job provides approximately \$39,000 in labor income, Forest Service expenditures provide \$48,000 in labor income per job. These findings reveal that jobs supported by Forest Service expenditures pay well compared to jobs supported by timber and

recreation activities on the Coconino NF. Timber and recreation-related employment is more likely to be seasonal, which contributes to the lower earnings.

The sectors with the most Coconino NF-related labor income are: accommodation and food services; manufacturing; health care and social assistance; retail trade; and wholesale trade. Many of these sectors are associated with the tourism economy.

Table 15 provides the estimated annual forest product volumes available, by alternative. These volumes are used to estimate the economic impact and financial efficiency of timber-related activities on the Coconino NF. This table will be referenced in alternative-specific descriptions of the economic consequences of forest product removal.

Table 15: Estimated Annual Forest Product Volumes, by Alternative

Forest Product	Alternative A Annual Volumes	Alternative B Annual Volumes	Alternative C Annual Volumes	Alternative D Annual Volumes
Harvest-Softwood 9+" Sawtimber (CCF)	71,646	168,220	168,220	168,220
Harvest-Softwood 5- 9" Pulp (CCF)	11,702	25,941	25,941	25,941
Poles (CCF)	24	24	24	24
Posts (CCF)	25	25	25	25
Fuelwood (CCF)	13,687	13,687	13,687	13,687
All Other Products (TONS)	122	122	122	122

Source: Coconino NF Silviculture Staff

Alternative A would provide the least amount of forest products. Alternatives B, C, and D would provide equivalent annual forest product volumes.

Financial Efficiency Analysis

Financial efficiency analysis compares Coconino NF expenditures and revenues throughout the life of the plan. Table 16 presents annual Coconino NF expenditures, by program area. These figures are based on average expenditures over the past three fiscal years (FY08-FY10). Future expenditures are uncertain and are heavily dependent on federal budget allocations.

Table 16: Annual Coconino NF Program Expenditures, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Range	\$588,091	\$588,091	\$588,091	\$588,091
Recreation	\$3,153,892	\$3,153,892	\$3,153,892	\$3,153,892
Minerals	\$115,369	\$115,369	\$115,369	\$115,369
Timber	\$1,215,002	\$1,215,002	\$1,215,002	\$1,215,002
Non-Recreation Special Uses	\$273,792	\$273,792	\$273,792	\$273,792

Source: Coconino NF Budget Staff

Table 17 shows annual Coconino NF revenues, by program area. Where available, these figures are based on average revenues over the past three fiscal years (FY08-FY10). When three years of data were unavailable, the most recent available year has been used. Changes in predicted revenues between alternatives were estimated in concert with the relevant resource specialist.

Table 17: Annual Coconino NF Program Revenue by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Range	\$180,797	\$180,797	\$180,797	\$180,797
Recreation	\$1,809,016	\$1,809,016	\$1,809,016	\$1,809,016
Minerals	\$17,813	\$17,813	\$17,813	\$17,813
Timber	\$773,366	\$1,801,575	\$1,801,575	\$1,801,575
Non-Recreation Special Uses	\$325,776	\$325,776	\$325,776	\$325,776

Source: Coconino NF Resource Specialists

Table 18 lists present net value (PNV) by program area and alternative. PNV is the difference between program revenues (benefits) and program expenditures (costs) over a 15-year period, using a 4 percent discount rate. The annual expenditures presented in Table 16 were summed over 15 years using a 4 percent discount rate (so that one dollar today is valued higher than one dollar in ten years). The sum of the discounted annual expenditures represents the present value of costs. The same exercise was conducted using the annual program revenues presented in Table 17. The sum of the discounted annual revenues represents the present value of benefits. The difference between the present value of costs and the present value of benefits is present net value. The higher the present net value, the more financially efficient the alternative.

Table 18: Present Net Value (PNV)* by Alternative and Program Area (15-year Period)

	Alternative A	Alternative B	Alternative C	Alternative D
Range	\$(4,935,746)	\$(4,935,746)	\$(4,935,746)	\$(4,935,746)
Recreation	\$(16,297,728)	\$(16,297,728)	\$(16,297,728)	\$(16,297,728)
Minerals	\$(1,182,221)	\$(1,182,221)	\$(1,182,221)	\$(1,182,221)
Timber	\$(5,351,916)	\$7,108,319	\$7,108,319	\$7,108,319
Non-Recreation Special Uses	\$629,962	\$629,962	\$629,962	\$629,962
Total PNV	\$(27,137,650)	\$(14,677,415)	\$(14,677,415)	\$(14,677,415)

Source: QuickSilver6 2010

*Figures in parenthesis indicate a negative number

The financial efficiency analysis assesses the degree to which Coconino NF expenditures contribute to Coconino NF revenues. When revenues exceed expenditures, a positive PNV is obtained – the cost of operation is below the revenues collected. The financial efficiency analysis does not consider the social costs and benefits of the Coconino NF. For instance, the PNV of the Coconino NF recreation program is negative because the costs of managing recreation on the Coconino NF exceed the recreation fees collected. However, the social benefits of recreation (e.g., how much an individual would be willing to pay, but is not required to pay, to recreate on the Coconino NF) are not captured in the analysis.

Social Consequences

Area residents and visitors attach numerous values to the Coconino NF. For some, NFS lands provide economic opportunities in rural communities. To others, the Coconino NF is valued for leisure. This binary classification, however, ignores the nuances of peoples' values. Furthermore, many individuals are likely to rely on the Coconino NF for both economic opportunities and leisure pursuits.

A number of social values have been associated with Southwest Region forests, including: (1) preservation of open space, (2) protection of ecosystem service and other forest-related amenity values, (3) economic opportunities from both commodity and non-commodity sources, (4) accessible and varied outdoor recreation opportunities, and (5) traditional tribal uses, such as gathering boughs and visiting sacred sites (USFS 2008). Timber management and lands recommended for wilderness are the main sources of potential variation in social and economic consequences between alternatives.

As the Affected Environment section describes, the study area has a great deal of publicly owned lands. This suggests that Forest Service decisions, and other federal actions, may have a substantial effect on social and economic well-being in the study area. The range of employment and labor income consequences (presented in Table 13 and Table 14) do not differ dramatically. However, alternatives B, C, and D have the highest expected levels of employment and income. For individuals who primarily value the Coconino NF for its contribution to the local economy, these alternatives are likely to be favored. However, the sources of economic impact vary between alternatives. Whereas alternative C offers the highest recreation-related employment, it has the lowest range-related employment among the considered alternatives. Therefore, although the aggregate economic impact between the alternatives is not expected to vary substantially, the economic impact from specific resource uses does vary between alternatives. As a result, the distributional economic impacts are likely to vary between alternatives – individuals who graze livestock on the Coconino NF, for instance, would see the largest changes under alternative C. Alternative A is expected to provide the lowest levels of employment and labor income to the local economy.

Table 19: Wilderness-Related Values, Acres by Alternative

	Alt. A	Alt. B	Alt C	Alt. D
Wilderness Characteristics* (Acres)	163,906 (8.9%)	180,965 (9.8%)	266,828 (14.5%)	166,198 (9.0%)
VQO Preservation/SIO Very High (Acres)	156,491 (8.5%)	222,256 (12.1%)	222,256 (12.1%)	222,256 (12.1%)
ROS Primitive (Acres)	158,608 (8.6%)	206,011 (11.2%)	285,608 (15.5%)	191,244 (10.4%)
Eligible Wild and Scenic River Segments (Acres)	16,312 (0.9%)	16,312 (0.9%)	16,312 (0.9%)	16,312 (0.9%)

Source: Coconino NF Resource Specialists

*This includes existing and recommended Wilderness Areas, Other Special Areas, Environmental Study Areas, the Cottonwood Basin Geological Area, and Proposed Research Natural Areas

Table 19 lists the acres with wilderness-related values, by alternative. Individuals who value resource protection above resource use are likely to derive benefit from the recommendation of additional lands for wilderness, regardless of intention to recreate in the wilderness. In 2005, approximately 6.9 percent of visits to the Coconino NF were to designated wilderness areas; by 2010, 10.6 percent of visits to the Coconino NF were to designated wilderness areas. Furthermore, between 2005 and 2010, Coconino NF wilderness visitation increased from 380,000 to 500,000 annual site visits, despite an overall decrease in Coconino NF visitation (USFS 2011a and USFS 2011b). Wilderness areas also have non-recreation values, such as the promotion of forest health and ecosystem services. Loomis and Richardson (2001) identify eight values related to wilderness and other protected lands: (1) recreation benefits, (2) community effects, (3) passive-use values, (4) scientific values, (5) biodiversity values, (6) off-site benefits, (7) ecological services, and (8) educational values. Alternative C is expected to appeal to people and groups who seek additional primitive recreation opportunities and/or the protection of forest resources, as it has the greatest acreage with wilderness-related values. Alternative B provides the second-highest acreage, followed by alternative D and alternative A.

The Environmental Justice analysis finds that that the study area has large shares of American Indian residents as well as high poverty rates. These findings raise the likelihood of observing disproportionate adverse effects to low income and/or minority residents. However, analysis of the decisions to be made under the alternatives finds no environmental justice consequences. Since all alternatives would continue to support similar levels of employment and income, none of the decisions are expected to exacerbate the poverty rate or disproportionately worsen the economic well-being of low-income individuals. Under all alternatives American Indian residents would be able to gather forest products and visit sacred sites. None of the alternatives are expected to disproportionately adversely affect racial and/or ethnic minority individuals.

Effects Common to All Alternatives

Minerals: Stone, sand and gravel, and gypsum are removed from the Coconino NF. The quantities removed are not expected to differ between alternatives. Under all alternatives, mineral

activities on the Coconino NF would support approximately 2 jobs and \$118,000 in labor income, annually.

Ecosystem Restoration: External funding supports mechanical thinning treatments on the Coconino NF. Approximately 1,400 acres would be treated annually. These activities are expected to support approximately 9 jobs and \$312,000 in labor income, annually.

Payments to States/Counties and Forest Expenditures: As noted in the Affected Environment section, the Coconino NF makes payments to local governments through the PILT and SRSCS programs. These payments would support approximately 56 jobs and \$2.8 million in labor income annually under all alternatives. In addition, Coconino NF salary and non-salary (e.g., office equipment) expenditures support approximately 508 jobs and \$24.7 million in labor income in the local economy, annually.

Alternative A: No Action

Alternative A would continue Coconino NF management according to the 1987 plan. Management actions under alternative A are expected to support approximately 4,573 jobs and \$174.3 million in labor income in the local economy.

Direct and Indirect Effects

Range: Under alternative A, 133,924 head months (HMs) would be permitted (119,177 for cattle/horses and 14,747 for sheep/goats). However, actual use will vary based on local forage and market conditions. Current actual utilization is 91,394 HMs (76,647 for cattle/horses and 14,747 for sheep/goats). Based on permitted HMs, approximately 330 jobs and \$5.3 million in labor income are supported by grazing on the Coconino NF, annually. Current utilization supports 236 jobs and \$3.8 million in labor income.

Recreation: Approximately 2 million people visit the Coconino NF annually; 57 percent of these visits originate outside of the local area. The expenditures of non-local visitors to the Coconino NF would support approximately 2,781 jobs and \$105.8 million in labor income, annually.

The 1987 plan guideline to create a wilderness permit system for the Red Rock-Secret Mountain Wilderness for day use and overnight camping has not been implemented. If this permit system were implemented, social and economic consequences could occur. First, the permit system could displace some visitors to other recreation sites on and off the Coconino NF. This displacement could reduce consumer surplus values. Second, the permit system could cause some individuals to choose not to recreate in the area, which would reduce the local economic impact of recreation. Third, some visitors would be unable to access favorite sites, which could reduce quality of life. Finally, the fees collected from the permit system would increase Coconino NF recreation receipts, which would increase the PNV (Table 18) of alternative A.

Timber: Alternative A has the lowest treatment levels among the considered alternatives. Based on the allowable sale quantities (ASQ) listed in Table 15, forest product removal under alternative A would support approximately 886 jobs and \$35.4 million in labor income in the local economy, annually.

Non-Market Values: Table 19 lists Coconino NF acres that would promote non-market and ecosystem service values. Alternative A has the fewest acres with wilderness-related values among the considered alternatives.

Loomis and Richardson (2001) calculated that “the designation of an additional 10,000-acre roadless area in the west as wilderness would yield about 3,875 additional visitor-days per year, providing a \$153,500 recreation value to visitors each year in the western United States.” In addition, they estimate that each 10,000 roadless acres provides \$155,000 in consumer surplus value, above and beyond what visitors spend on the experience. Lands with wilderness characteristics and primitive settings may also enhance ecosystem service values. Estimates of non-market values specific to the Coconino NF are not available; however, the estimates from Loomis and Richardson (2001) serve to indicate the potential magnitude of non-market economic values on the Coconino NF.

Present Net Value: As shown in Table 18, the present net value (PNV) of alternative A is estimated to be \$(27,137,650) based on the Coconino NF’s annual program revenues and expenditures. This is the lowest PNV among the considered alternatives.

Alternative A has the lowest present net value primarily due to the lower expected volume of forest product removal from the Coconino NF. The forest would receive the lowest amount of timber-related revenue under alternative A, yet the costs of administering timber resources are not expected to differ among alternatives. As discussed above, this assumption arose from the uncertainty of future budgets.

Alternative B: Proposed Alternative

Management actions under alternative B are expected to support approximately 5,693 jobs and \$218.6 million in labor income in the local economy.

Direct and Indirect Effects

Range: Under alternative B, 133,924 head months (HMs) would be permitted (119,177 for cattle/horses and 14,747 for sheep/goats). However, actual use will vary based on local forage and market conditions. Based on permitted HMs, approximately 330 jobs and \$5.3 million in labor income are supported by grazing on the Coconino NF, annually.

Recreation: Coconino NF visitation is not expected to change under alternative B. Therefore, alternative B would support approximately 2,781 jobs and \$105.8 million in labor income in the local economy, annually.

Timber: Alternative B has higher treatment levels than alternative A, and would therefore increase local employment and labor income related to timber activities on the Coconino NF. Based on the ASQs listed in Table 15, forest product removal under alternative B would support approximately 2,007 jobs and \$79.7 million in labor income in the local economy, annually.

Non-Market Values: Table 19 lists Coconino NF acres that would promote non-market and ecosystem service values. Alternative B has the second-highest acres with wilderness-related values among the considered alternatives.

As discussed under alternative A, Loomis and Richardson (2001) provides monetary estimates of the value of lands with wilderness characteristics.

Present Net Value: As shown in Table 18, the PNV of alternative B is estimated to be \$(14,677,415) based on the Coconino NF’s annual program revenues and expenditures. This is a higher PNV (more financially efficient) than alternative A.

Alternative C

Management actions under alternative C are expected to support approximately 5,716 jobs and \$219.5 million in labor income in the local economy.

Direct and Indirect Effects

Range: Under Alternative C, 133,924 head months (HMs) would be permitted (119,177 for cattle/horses and 14,747 for sheep/goats). However, actual use will vary based on local forage and market conditions. Based on permitted HMs, alternative D would support approximately 330 jobs and \$5.3 million in labor income on the Coconino NF, annually.

Recreation: Alternative C is expected to slightly increase the number of non-local visitors to the Coconino NF annually due to increased acreage of special areas, particularly recommended wilderness. Higher visitation would support additional employment and labor income in recreation-related sectors in the local economy. Therefore, the economic contribution of recreation on the Coconino NF would increase to 2,803 jobs and \$106.6 million in labor income, annually.

Timber: Alternative C has identical ASQs to alternative B. Therefore, alternative C would also support approximately 2,007 jobs and \$79.7 million in labor income in the local economy, annually.

Non-Market Values: Table 19 lists Coconino NF acres that would promote non-market and ecosystem service values. Alternative C has the highest acres with wilderness-related values among the considered alternatives.

As discussed under alternative A, Loomis and Richardson (2001) provides monetary estimates of the value of lands with wilderness characteristics.

Present Net Value: As shown in Table 18, the PNV of alternative C is estimated to be \$(14,677,415) based on the Coconino NF's annual program revenues and expenditures. This is a higher PNV (more financially efficient) than alternative A.

Alternative C has a higher present net value than alternative A as a result of expected increases in timber-related revenue and no expected changes in Coconino NF timber management costs

Alternative D

Management actions under alternative D are expected to support approximately 5,693 jobs and \$218.6 million in labor income in the local economy.

Direct and Indirect Effects

Range: Under alternative D, 133,924 head months (HMs) would be permitted (119,177 for cattle/horses and 14,747 for sheep/goats). However, actual use will vary based on local forage and market conditions. Based on permitted HMs, alternative D would support approximately 330 jobs and \$5.3 million in labor income on the Coconino NF, annually.

Recreation: Coconino NF visitation is not expected to change under alternative D. Therefore, alternative D would support approximately 2,781 jobs and \$105.8 million in labor income in the local economy, annually.

Timber: Alternative D has identical ASQs to alternatives B and C. Therefore, alternative D would also support approximately 2,007 jobs and \$79.7 million in labor income in the local economy, annually.

Non-Market Values: Table 19 lists Coconino NF acres that would promote non-market and ecosystem service values. Alternative D has the second-fewest acres with wilderness-related values among the considered alternatives.

As discussed under alternative A, Loomis and Richardson (2001) provides monetary estimates of the value of lands with wilderness characteristics.

Present Net Value: As shown in Table 18, the PNV of alternative D is estimated to be \$(14,677,415) based on the Coconino NF's annual program revenues and expenditures. This is a higher present net value (more financially efficient) than alternatives A.

Alternative D has a higher present net value than alternative A as a result of expected increases in timber-related revenue and no expected changes in Coconino NF timber management costs. The present net values of alternatives B, C, and D are equivalent.

Cumulative Effects – All Alternatives

The geographic scope for the social and economic cumulative effects analysis is the three-county region³ identified in the affected environment section. This analysis considers how past, present, and reasonably foreseeable future actions on lands throughout the region may interact with decisions made under the proposed plan to affect the social and economic environment. The social and economic analysis of the proposed plan is unique among the resources and uses in that the effects occur primarily off the forests. In this way, the indirect effects described above are cumulative in nature—they evaluate the role of Forest Service decisions under the proposed plan both on and off the Coconino National Forest. However, the indirect effects analysis does not address how actions taken on adjacent lands will affect the social and economic consequences of the proposed plan.

The proposed plan emphasizes ecosystem restoration under all alternatives. Current and proposed plans on adjacent National Forest System lands also emphasize ecosystem restoration. The scale of the proposed treatments (on Coconino National Forest and adjacent lands) is expected to draw new forest product harvesting and processing firms to the region. The timber and ecosystem restoration estimates presented in the environmental consequences section are based on a static model of the economy. However, if additional firms locate in the area due to regionwide restoration efforts, the local economic impact of activities to occur under the proposed plan would increase.

The recreation-related effects identified in the social and economic environmental consequences section may be influenced by trends and activities that occur off the forests. The proximity of the Coconino National Forest to other popular recreation sites, particularly the Grand Canyon, drives high rates of tourism throughout the region. In fiscal year 2010, Arizona State Parks closed 13 of its 28 parks. Although most of these parks have reopened, a number are open on a reduced schedule. Furthermore, the possibility of future closures remains due to ongoing budget uncertainty. The reduction in recreation opportunities on State lands may increase demand for recreation on the Coconino National Forest. Under all alternatives, the proposed plan supports

³ Coconino, Maricopa, and Yavapai counties.

diverse recreational opportunities on the forests. Increased recreational use on the Coconino National Forest would lead to a higher economic impact than predicted in the indirect effects discussion. However, other adjacent lands (Bureau of Land Management, National Park Service, and other National Forest System lands) continue to emphasize the provision of recreation opportunities in their land and resource management plans. These actions may counterbalance the consequences of reduced opportunities elsewhere in the State.

Under the proposed plan, the Coconino National Forest may provide infrastructure to support reasonably foreseeable alternative energy development in the region. Growing interest in renewable energy sources, particularly geothermal development, could lead to more employment in these sectors throughout the region. The Department of the Interior is emphasizing alternative energy as a management priority. The Bureau of Land Management's Solar Programmatic Environmental Impact Statement (Solar PEIS) identified lands in the region as having a high potential for solar development. The Centennial West power corridor for alternative energy would expand alternative energy development from New Mexico to California.

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Appendix A: Race and Ethnicity Breakdown

Table 20: Race and Ethnicity in the Study Area

	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic or Latino
Coconino County	61.7%	1.2%	27.3%	1.4%	0.1%	5.2%	3.1%	13.5%
Maricopa County	73.0%	5.0%	2.1%	3.5%	0.2%	12.8%	3.5%	29.6%
Yavapai County	89.3%	0.6%	1.7%	0.8%	0.1%	4.9%	2.5%	13.6%
Arizona	73.0%	4.1%	4.6%	2.8%	0.2%	11.9%	3.4%	29.6%
United States	72.4%	12.6%	0.9%	4.8%	0.2%	6.2%	2.9%	16.3%

Source: U.S. Census Bureau 2010