

Chapter 3: Affected Environment

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3.1 Introduction

This chapter is a description and summary of the existing conditions of the resources that may be affected by the alternatives being considered in this EIS.

3.1.1 Organization

Chapter 3 is organized by resource issue as outlined in Section 1.7.2 and as follows:

Section 3.2: Socioeconomic Resources

Section 3.3: Soils and Geologic Hazards

Section 3.4: Transportation

Section 3.5: Inventoried Roadless Areas

Section 3.6: Watershed Resources, Including Wetlands, Floodplains, and Riparian Areas

Section 3.7: Water Resources, Including Culinary and Municipal Water Systems, Surface Water, and Groundwater

Section 3.8: Vegetative Resources, Including Upland Vegetation, Noxious Weeds, and Invasive Species

Section 3.9: Terrestrial and Aquatic Flora and Fauna, Including Threatened and Endangered Species, Sensitive Species, and Management Indicator Species

Section 3.10: Air Resources

Section 3.11: Visual Resources

Section 3.12: Cultural and Traditional Heritage Resources

Section 3.13: Developed and Dispersed Recreation

Section 3.14: Other Mineral Resource Extraction Activities

Resource descriptions are organized as follows:

- **Overview:** a succinct description of the resource; containing only the information that is relevant for understanding the impacts analysis in Chapter 4: Environmental Consequences. Overviews are only included for resources that have a substantial amount of technical information. Otherwise please see the introduction and affected environment of each resource for a description of that resource.
- **Introduction:** Generally contains a brief description of the resource and may contain a summary of relevant terms, laws, and/or regulations.
- **Affected Environment:** This section begins with a forest-wide summary of the resource. Following the forest-wide summary, the resource is summarized by each RFOGD with oil and gas potential (see section 1.8: Reasonably Foreseeable Development Scenario). The information included in each RFOGD description is applicable to all MAs that lie

within the RFOGD. If there is information specific to an MA, that information is noted and included.

3.2 Socioeconomic Resources

3.2.1 Overview

Regulations from the Council on Environmental Quality (CEQ) direct agencies to insure the professional and scientific integrity of environmental analyses in an EIS. This direction includes using the best available science to describe existing conditions in the Project Area; in this case, the UNF. Published, peer reviewed studies are used when applicable to conditions in the UNF; however, in most cases only those studies that are relevant to identifying potential impacts from the proposed action (in Chapter 4) are considered. These studies are cited in the text. The most relevant literature for most resources in Chapter 3 comes from internal Forest Service publications and reports, because this information is based on UNF-specific investigations and assessments. Throughout Chapter 3, the UNF Land and Resource Management Plan (USFS 2003) and associated EIS (USFS 2003a) are the most frequently cited documents. These documents were not peer reviewed within the scientific community, but were written using best available science, open to public comment as dictated by the NEPA process, and revised accordingly by resource specialists.

The UNF is considered an urban forest, which means that the UNF is located near a highly populated area and that much of the use of the UNF comes from residents of the urban area. The urban area for the UNF is Utah County and the Wasatch Front. In 2005, Utah County had a population of approximately 460,000 and the Wasatch Front, which is Utah’s most urban area, had a population of approximately 1.5 million (OPB 2006).

An economic study conducted for the UNF in 1999 analyzed both the economic impacts of the UNF on local economies with urban areas included (i.e., Comprehensive Economic Analysis Area (CEAA)), and economic impacts on local economies with urban areas excluded (i.e., Rural Economic Analysis Area (REAA)) (see inset for a description of these areas). The purpose of having two analysis areas is to compare the economic impacts of the UNF on rural communities versus urban areas.

The study showed that in the CEAA, forest-related cumulative output only accounted for six percent of the overall economy. However, when only rural areas were analyzed, forest-related activities contributed approximately 16 percent to the cumulative output. This trend is seen with employment as well. Forest-related industries accounted for 9.4 percent of direct employment with urban areas included. In rural areas, forest-related industries accounted for 20.5 percent of direct employment. In short, forest-related activities and industries have a greater economic impact on rural areas than on urban areas.

In summary, although cumulative output of forest-related activities is greater in the CEAA, these industries account for a greater percentage of the total output in the REAA, as well as greater direct output and employment. In the CEAA, industries not related to the UNF, such as services

Comprehensive Economic Analysis Area (CEAA): Juab, Utah, and Wasatch Counties, as well as those portions of Duchesne, Sanpete, Summit, and Tooele Counties with direct economic ties to the UNF.

Rural Economic Analysis Area (REAA): Juab and Wasatch Counties, and the same portions of Duchesne, Sanpete, Summit, and Tooele Counties as the comprehensive analysis, however, urban areas of Utah County have been eliminated.

Output: produced goods and services.

and manufacturing, play a substantial and significant economic role. In addition, high employment in tourism in Utah County, coupled with low direct output for forest-related industries suggests that tourism in Utah County is largely not related to UNF activities. In contrast, rural areas have a greater dependence of forest-related industries due to the contributions of direct output and employment. In addition, cumulative impacts of forest-related industries are likely strongly associated with UNF activities in rural areas because rural areas offer fewer activities outside the UNF than do urban areas.

This socioeconomic resource evaluation also looks at social values including environmental justice issues. Environmental justice relates to assessing how low-income or minority groups may be impacted by an activity or program. Overall, forest resources are equally available to all groups, and a national visitor use survey indicates that the percentage of minority users is reflective of the racial diversity of the counties surrounding and located within the UNF (see tables 3.2 and 3.3 (USFS 2002). Racial diversity in the counties surrounding and within the UNF is roughly the same as that of the State of Utah (see table 3.3).

Social Environment

The social environment is comprised of the people living in and adjacent to the UNF. It includes the lifestyles and attitudes of people toward the area’s resources and the ways in which these resources are used.

Long-time residents and others often have strong historical and emotional ties to the Forest. A large portion of current Utah residents have a strong sense of place in connection with the Forest and surrounding area, as many families have lived here for generations. The openness and solitude offered by the NFS will become increasingly important to residents as open space becomes more scarce in and near urban areas. The resources of the UNF play an important role now and will continue to do so in the future for many of these people.

Many UNF users have economic dependencies on Forest resources. Water originating on NFS lands serves agricultural, industrial, business, and residential uses. Grazing permittees rely on the availability of suitable forage for grazing livestock. Outfitters and guides for various wildlife and recreation-related uses rely on National Forest resources for all or part of their living. Many local communities rely on the employment and income generated as a result of the existence and/or use of forest resources.

With the exception of a small parcel of Ute Tribal lands adjacent to Soldier Bay at Strawberry Reservoir, current Goshute and Ute Tribal lands do not lie adjacent to the UNF. Nonetheless there is a desire to maintain the ability to access the Forest for the purpose of gathering traditional plant materials important to their cultural traditions. Continued viability of these species as well as access to the plants provides essential links to the past.

3.2.2 Introduction

Resources originating on NFS lands serve agricultural, industrial, business, and residential uses. For instance, grazing permittees rely on the availability of suitable forage for grazing livestock; outfitters and guides for various wildlife and recreation-related uses rely on National Forest resources for all or part of their living; and many local communities rely on the employment and income generated as a result of the existence and/or use of forest resources. In addition, Native

American Tribes, such as the Goshute and Ute, need to maintain access to the UNF for the purpose of gathering traditional plant materials important to their cultural traditions (USFS 2003). This section summarizes the socioeconomic environment of the UNF as it impacts State and local economies.

3.2.3 Affected Environment

Population

According to the U.S. Census Bureau, Utah is the fifth fastest growing State in the nation. The population of Utah in 2005 was estimated to be 2.5 million, which is a 3.2 percent increase from 2004. Although Utah has the nation’s highest fertility rate (2.56 in 2002), net migration into Utah accounted for 52 percent of this population increase (OPB 2006). Population estimates for the counties containing or adjacent to UNF are provided in table 3.1. Population growth rates for these counties were among the highest in the State.

Table 3.1. Population estimates for UNF counties.

County	Population in 2005	Percent change from 2004	Percent change from 2000
Duchesne	15,237	2.0	5.8
Juab	8,974	1.7	1.5
Sanpete	25,454	1.6	2.2
Summit	36,283	3.4	3.8
Tooele	52,133	4.1	4.6
Utah	456,073	4.2	4.2
Wasatch	19,999	4.3	5.3

Source: OPB 2006.

Total population for the Wasatch Front, which comprises most of the State’s major population centers and accounts for much of the use of the UNF, was over 1.53 million in 2005. The Wasatch Front is the most heavily populated area in Utah and accounts for approximately 60 percent of the state’s total population (OPB 2006).

Utah’s population is expected to increase to 2.8 million by 2010, with a 50-year projection of 5.4 million people (OPB 2006). In 2001 the USFS conducted a National Visitor Use Monitoring Project for the UNF, which identified popular recreational activities with visitors to the UNF. The majority of visitors (77 percent) came to the UNF to escape the heat and noise of urban population centers (USFS 2002). As Utah’s population increases and open space becomes more limited, the solitude and natural environment provided by the UNF will become more important to the social climate of the urban Wasatch Front.

Racial Diversity and Environmental Justice

Regulatory guidance for the evaluation of environmental justice includes EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and EO 13045, Protection of Children From Environmental Health and Safety Risks.

- EO 12898 requires each Federal agency to consider potential human health and environmental impacts of its programs, policies, and activities on minority and low-income populations.
- EO 13045 prioritizes the identification and analysis of environmental health and safety risks that may affect children.

Environmental justice allows all people to share in the benefits of, and not be excluded from or affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment. Departmental Regulation 5600-2, issued December 15, 1997, provides direction to agencies for integrating environmental justice considerations into USDA programs and activities in compliance with EO 12898.

The majority of the Utah population is white, with Hispanic residents accounting for approximately 10 percent. The UNF is close to the Ute and Goshute Indian Tribes. Table 3.2 summarizes the racial makeup of Utah and the counties containing and surrounding the UNF. Summit and Tooele counties have the largest concentrations of Hispanic origin. People of African American descent make up the smallest demographic in the State, accounting for less than one percent of the population.

Table 3.2. Racial diversity of Utah and UNF counties.

Area	Total Population	Percent White*	Percent African American*	Percent American Indian*	Percent Asian & Pacific Islander*	Percent Hispanic*
State	2,389,039	93.8	0.9	1.3	2.6	10.6
Duchesne	15,004	92.6	0.2	5.1	0.4	4.3
Juab	9,009	98.0	0.2	1.1	0.6	2.2
Sanpete	23,649	96.5	0.4	1.0	1.3	7.5
Summit	33,843	97.3	0.4	0.4	1.2	10.2
Tooele	49,668	94.3	1.5	1.5	1.1	9.7
Utah	403,352	95.7	0.4	0.6	1.8	8.2
Wasatch	18,139	97.0	0.2	0.9	0.5	7.3

**Percentages exceeding 100% may result from individuals reporting they were members of more than one race. Source: OPB 2006.*

Visitors to the UNF reflect the racial diversity of the State, with the majority being of white descent, followed by Hispanic visitors (table 3.3). Visits by all other minorities accounted for only 1.5 percent of total visits.

Table 3.3. Ethnicity of UNF recreation visitors.

Ethnicity	% of Total UNF Visits
African American	0.2
Asian	0.7
White	95.0
American Indian/Alaska Native	0.3
Native Hawaiian or Other Pacific Islander	0.2
Spanish, Hispanic, or Latino	3.5
Other	0.1

Source: USFS 2002.

The three-year average poverty rate from 2002 to 2004 in Utah was 9.6 percent, which is less than the national average of 12.6 percent for the same period. Utah has one of the lowest poverty rates in the mountain States.

Economic Environment

In 2005 Utah’s economy continued its recovery from the slump that began in 2001. Job growth rebounded 3.5 percent in 2005, and the unemployment rate was 4.7 percent, down from 5.2 percent in 2004 and among the nation’s lowest. Growth from 2004 to 2005 was particularly high in the natural resources and mining sector (14.4 percent) and the construction sector (11.2 percent). Changes in annual wages and personal income reflected job growth, with average annual wages up 3.8 percent from 2004 and total personal income up 8.1 percent from 2004. As job growth expands and the population increases, Utah’s economy is expected to grow stronger in the near future. Employment is expected to grow 3.3 percent during 2006, and the unemployment rate is expected to fall to 4.4 percent (OPB 2006).

The Land and Resource Management Plan (LRMP) for the UNF completed an in-depth economic analysis for counties containing and surrounding the UNF (USFS 2003). The CEAA includes all of Juab, Utah, and Wasatch counties, as well as those portions of Duchesne, Sanpete, Summit, and Tooele counties with direct economic ties to the UNF. In the CEAA, urban population centers along the Wasatch Front in Utah County are included, which may conceal the importance of forest-related industries for rural areas. A second analysis was conducted, a REAA, which excluded urban areas of Utah County in order to accurately characterize the economic impacts of forest-related industries on rural communities. In this analysis, the REAA contains all of Juab and Wasatch counties, and the same portions of Duchesne, Sanpete, Summit, and Tooele counties as the CEAA; however, urban areas of Utah County have been eliminated.

Both analyses evaluated the direct, indirect, and induced effects of individual economic sectors for which UNF Lands may play a role on the economy. Individual sectors were also aggregated into more general categories. Sectors and aggregated categories are summarized in table 3.4.

Table 3.4. Individual and aggregated sectors used in the UNF's economic analysis.

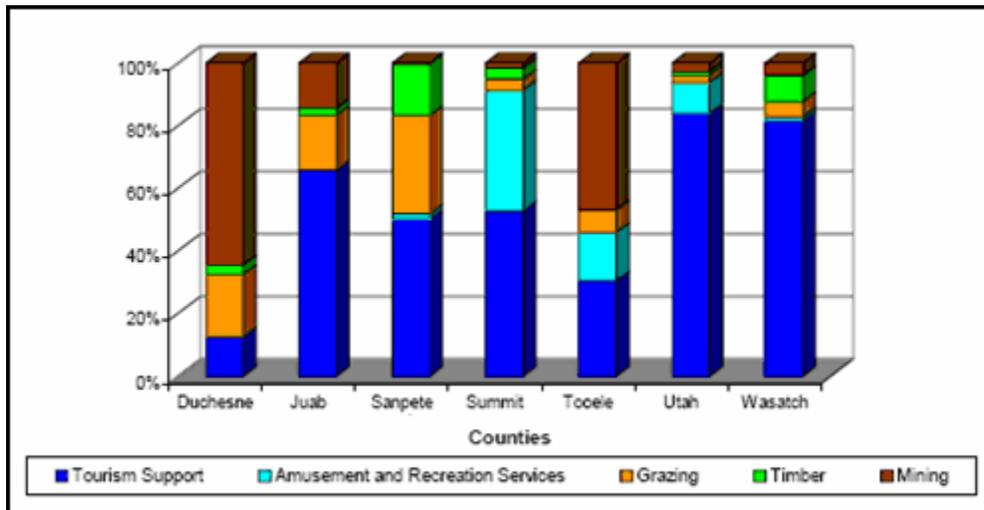
Individual Sector	Aggregated Sector
Range Fed Cattle	Grazing
Sheep, Lambs, and Goats	
Hotels and Lodging Places	Tourism Support
Automotive Renting and Leasing	
Eating and Drinking	
Amusement and Recreation Services	Amusement and Recreation Services
Forestry Products	Timber
Logging Camps and Logging	
Hardwood Dimension and Flooring	
Pulp Mills	
Agricultural, Forestry, and Fishery Services	
Sawmills and Planing Mills, General	
Special Products Sawmills	
Paper Mills, except Building Paper	
Natural Gas and Crude Petroleum	
Natural Gas Liquids	
Sand and Gravel	
Nonmetallic Minerals	
Coal Mining	
Dimension Stone	
Clay, Ceramic, etc.	
All other mining related sectors	

Source: USFS 2003.

Overall, tourism support is the largest sector for direct output in the UNF counties (figure 3.1). In Duchesne and Tooele, mining contributes the largest direct output, while tourism has the largest output in the other four counties. Grazing also contributes a substantial portion of direct output in Juab and Sanpete, while amusement and recreation services accounts for much of the direct output in Summit County.

Figure 3.1. Forest-related direct output in UNF counties, 1999.

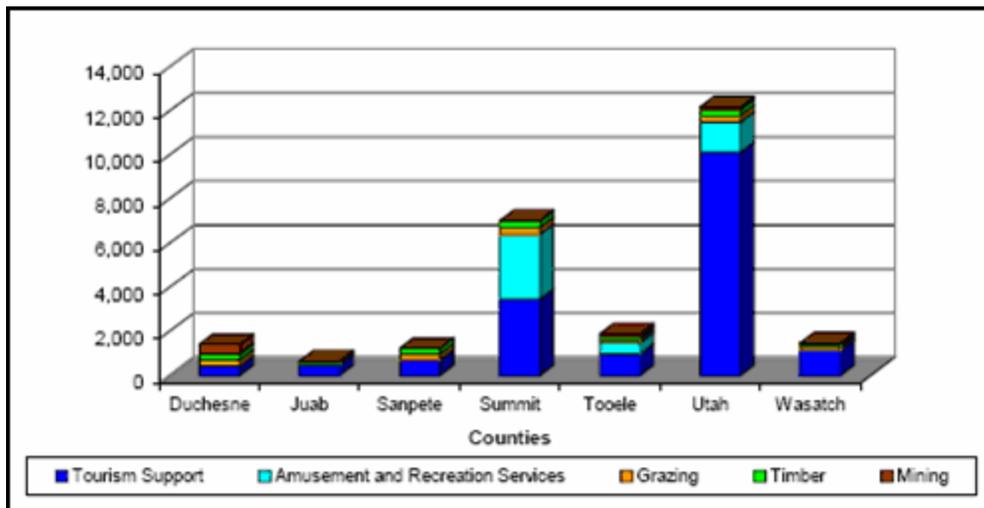
Source: USDA Forest Service, IMPLAN Analysis, Output, Value Added, and Employment (USDA 2002i as cited in USFS 2003).



Forest-related employment is highest in Summit and Utah counties, and accounts for employment of less than 2,000 individuals in the rest of the UNF counties (figure 3.2). In Summit County, tourism support and amusement and recreation services employ a similar proportion of individuals, while tourism support accounts for the majority of forest-related industry employment in Utah County.

Figure 3.2. Forest-related direct employment in UNF counties, 1999.

Source: USDA Forest Service, IMPLAN Analysis, Output, Value Added, and Employment (USDA 2002i as cited in USFS 2003).



Trends from the 1999 economic output in the CEAA suggest that forest-related industries do not have a substantial economic impact in the area. Forest-related industries account for only four percent of total direct output in 1999, of which more than half was attributed to tourism support (figure 3.3). Forest-related industries did account for nearly 10 percent of direct employment in the CEAA, with the majority (5.7 percent) of employment in tourism support (figure 3.4). It is

important to note that these values do not reflect forest activities only, but rather, include a broad spectrum of activities of which forest-related activities are but one segment.

Figure 3.3. Direct output by economic sector in the CEEA, 1999.

Source: USDA Forest Service, IMPLAN Analysis, July 2002 (USDA 2002i as cited in USFS 2003).

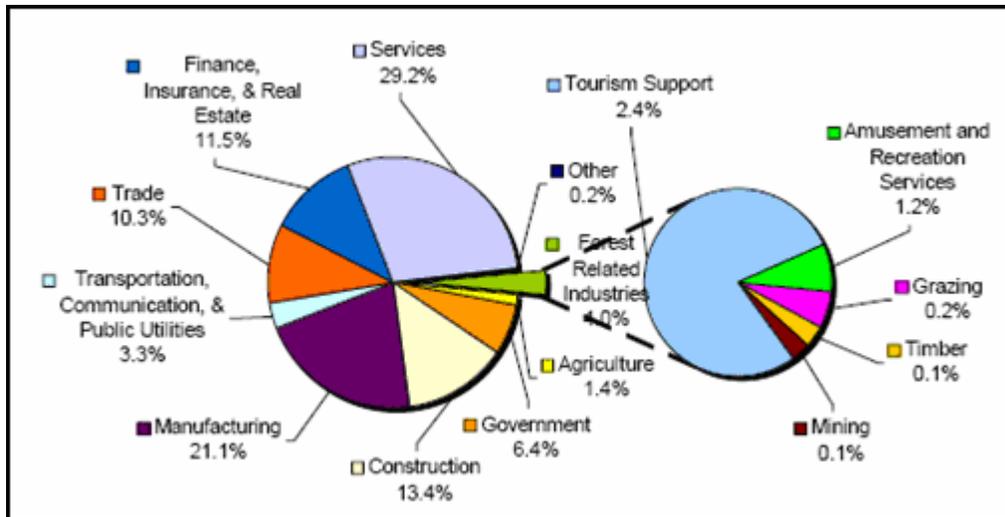
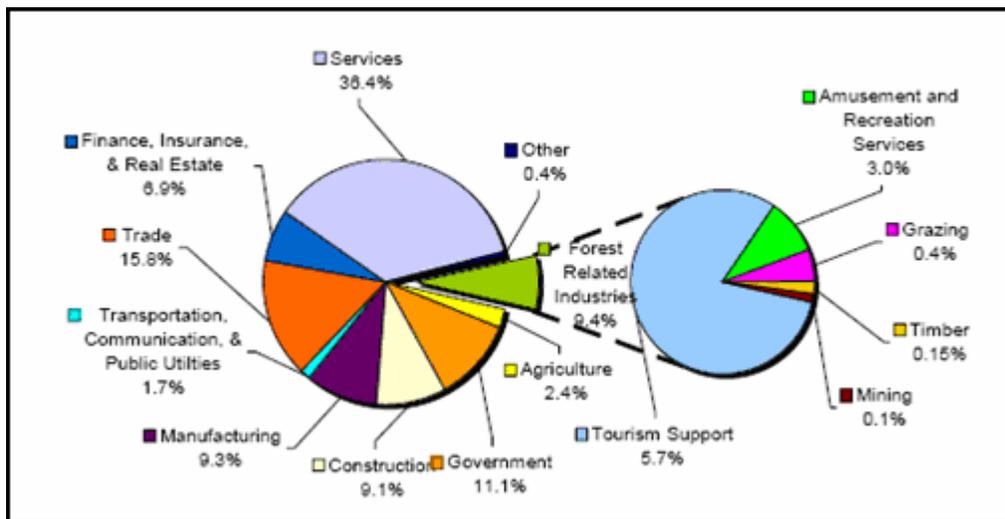


Figure 3.4. Direct employment by economic sector in the CEEA, 1999.

Source: USDA Forest Service, IMPLAN Analysis, July 2002 (USDA 2002i as cited in USFS 2003).



However, direct output and employment values do not consider the wide-ranging cumulative impact that forest-related industries may have on the economic output of the CEEA due to indirect and induced impacts. Table 3.5 presents the direct, indirect, and induced output impacts for selected economic sectors in the CEEA, as well as the proportion of the total CEEA output contributed by these sectors.

In total, forest-related economic sectors accounted for nearly 940 million dollars, which is 6.3 percent of the total CEEA output. Over 700 million dollars was contributed by two primary sectors: eating and drinking, which accounted for three percent of the total CEEA output, and

automobile dealers and service stations, which accounted for two percent of the total CEAA output.

Table 3.5. Cumulative output impacts for selected economic sectors in the CEAA for 1999.

Economic Sector	Direct Output (Million \$)	Indirect Output (Million \$)	Induced Output (Million \$)	Total Output (Million \$)	% of Total Analysis Area Output
Range Fed Cattle	18.525	10.450	3.658	32.633	0.2
Sheep, Lambs, and Goats	4.119	1.590	0.787	6.495	0.04
Sand and Gravel	6.281	0.992	1.614	8.887	0.06
Sawmills and Planing Mills	9.622	5.273	1.476	16.371	0.1
Automobile Dealers and Service Stations	205.163	32.961	57.011	295.135	2.0
Hotels and Lodging Places	49.963	13.617	13.616	77.196	0.5
Eating and Drinking	295.039	80.020	69.262	444.323	3.0
Amusement and Recreation Services	36.487	7.477	9.915	53.879	0.4

Source: USDA Forest Service, IMPLAN Analysis, Impact Analysis, July 2002 (USDA 2002i as cited in USFS 2003).

Trends in 1999 economic output for the REAA suggest that forest-related industries do have a larger economic impact on rural areas, where direct output tends to be more evenly distributed among the various industries (figure 3.5). Forest-related industries accounted for 11.2 percent of direct output in this analysis, compared to only four percent in the CEAA. Of this output, 6.1 percent was attributed to tourism support. Forest-related industries also had the highest direct employment of any sector in 1999, accounting for 20.5 percent of direct employment in the REAA (figure 3.6). Tourism support employed more than half of this percentage (12.5 percent), followed by grazing (3.6 percent) and amusement and recreation services (3.0 percent).

Figure 3.5. Direct output by economic sector in the REAA, 1999.

Source: USDA Forest Service, IMPLAN Analysis, Impact Analysis, July 2002 (USDA 2002i as cited in USFS 2003).

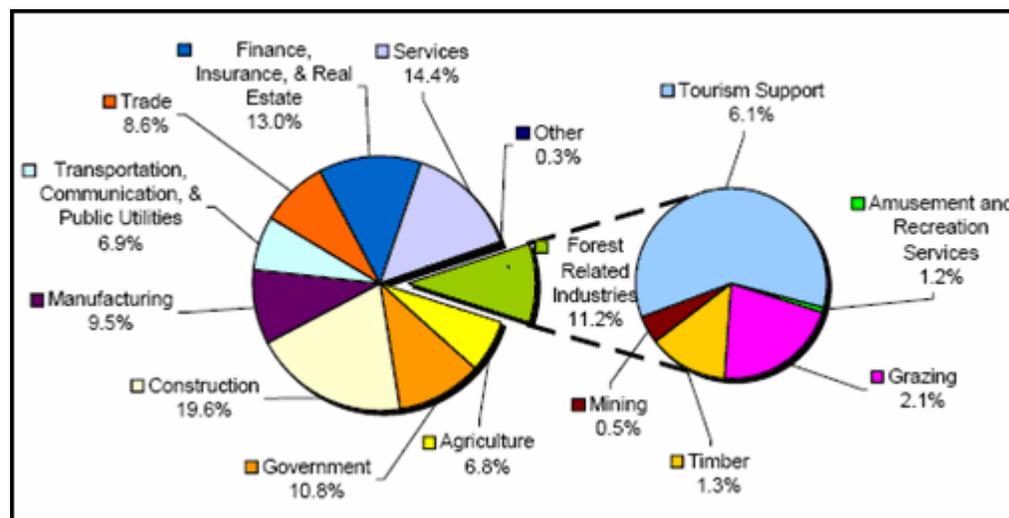
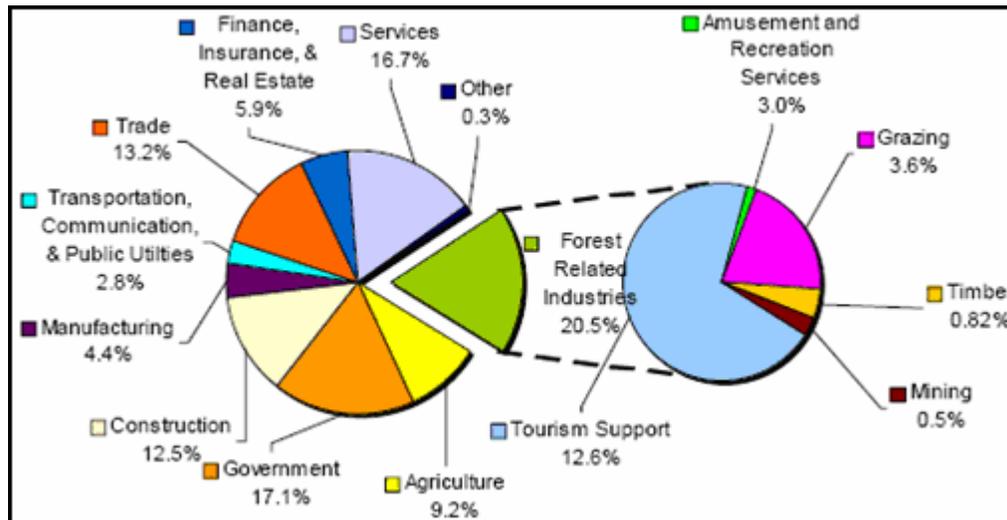


Figure 3.6. Direct employment by economic sector in the REAA, 1999.

Source: USDA Forest Service, IMPLAN Analysis, Impact Analysis, July 2002 (USDA 2002i as cited in USFS 2003).



Based on trends in 1999, direct output of forest-related industries does have a substantial economic impact in the REAA, particularly in direct employment. However, direct output neglects to account for cumulative impacts in economic sectors. Table 3.6 summarizes the direct, indirect, and induced output for selected forest-related economic sectors, and presents the proportion of total REAA output contributed by each sector in 1999.

Table 3.6. Cumulative output for selected economic sectors in the REAA for 1999.

Economic Sector	Direct Output (Million \$)	Indirect Output (Million \$)	Induced Output (Million \$)	Total Output (Million \$)	% of Total Analysis Area Output
Range Fed Cattle	13.595	7.209	1.981	22.785	2.3
Sheep, Lambs, and Goats	2.867	0.995	0.411	4.273	0.4
Sand and Gravel	1.437	0.234	0.264	1.935	0.2
Sawmills and Planing Mills	9.031	4.503	0.911	14.444	1.5
Automobile Dealers and Service Stations	21.064	2.958	4.178	28.200	2.9
Hotels and Lodging Places	20.872	4.857	3.954	29.683	3.0
Eating and Drinking	37.781	8.156	6.215	52.152	5.3
Amusement and Recreation Services	0.730	0.130	0.140	1.000	0.1

Source: USDA Forest Service, IMPLAN Analysis, Impact Analysis, July 2002 (USDA 2002i as cited in USFS 2003).

Forest-related economic sectors contributed a cumulative total of 154 million dollars to the economy. Although forest-related economic sectors contributed less overall in the REAA compared to the CEAA (\$154 million compared to \$940 million), these sectors accounted for nearly 16 percent of the total REAA output, compared to approximately only six percent in the CEAA. Eating and drinking accounted for the highest percentage of the total CEAA output at 5.3 percent, followed by hotels and lodging (3 percent), automobile dealers and service stations (2.9 percent), and range-fed cattle (2.3 percent).