

**Regional Economic Benefits of the Herger-Feinstein Quincy
Library Group Forest Recovery Act**

Fiscal Year 2001, October 2000 through September 2001

U. S. Department of Agriculture
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Summary of Results

Fiscal year 2001 was a period when the Herger-Feinstein Quincy Library Group Forest Recovery Act (HFQLG Act) began to generate more revenue for local forest communities from the Forest Service and increasingly benefit the local economy. Over \$25 million was spent during fiscal year 2001 (October 2000 through September 2001) to plan and implement the HFQLG Act. Many of the benefits extended to Lassen, Plumas, and Sierra counties, referred to as the Core Area subject to the HFQLG Act, while many extended to the Peripheral Area of Butte, Nevada, Shasta, Tehama, Trinity, and Yuba counties¹.

While the final figures for year 2001 economic output, jobs, and personal income will not be released until May of 2003, the Center for Economic Development (CED) at California State University, Chico, believes that the northern Sierra experienced economic growth at about 2 percent. The region has benefited from some tourism and business growth resulting from very modest growth at the state level, coupled with the economic effects of the HFQLG Act. This information is as of the end of September and does not take into consideration the events of September 11, 2001.

Over \$42.0 million were spent in the local economy in Lassen, Plumas, and Sierra counties, both directly and indirectly, as a result of work related to the HFQLG Act in fiscal year 2001. This figure was nearly four times the fiscal year 2000 amount of \$11.2 million.

Of the nearly \$25.2 million (*does not include indirect overhead expenses*) spent by the HFQLG Act during fiscal year 2001, nearly \$7.5 million was spent on payroll directly in the Core Area. Other funds were spend in the form of travel reimbursements, purchases from local vendors, payments to consultants, and reimbursements to other Forest Service budgets for purchases or services related to the HFQLG Act. These funds were spent both inside and outside the Core and Peripheral Areas.

Some of the dollars spent in the Core Area was respent within the area anywhere from once to several times over. This resulted in a total indirect economic benefit of nearly \$16.9 million. In addition, dollars spent and respent in the Peripheral Area totaled \$14.3 million, resulting in a total economic output benefit of \$56.3 million as a result of planning and implementation of the HFQLG Act in fiscal year 2001.

In addition, the HFQLG Act directly supported 145 full-time equivalent (FTE) jobs in the local economy in fiscal year 2001. This is over 1.5 times more that the 90 local FTE jobs directly supported by last year's spending. Estimated economic benefits in the Core Area led to an estimated additional 106 FTE jobs supported for a total employment benefit of 251 FTE jobs, 1.4 times last year's 179 total FTE jobs supported by the HFQLG Act. In the Peripheral Area, 132 additional jobs were supported, bringing the total benefit to 383 jobs supported in the Core and Peripheral Areas combined.

The HFQLG Act supported \$5.4 million of labor income in the Core Area during fiscal year 2001. An additional \$7.8 million of labor income was supported in the Peripheral Area. When added to the \$7.5 million in Forest Service payroll, nearly \$20.7 million in labor income was supported by planning and implementation of the HFQLG Act in fiscal year 2001.

Purpose

President Bill Clinton signed the HFQLG Act on October 21, 1998. The act was a mandate to the U. S. Forest Service to set up a pilot project in the Lassen National Forest, the Plumas National Forest, and the Sierraville Ranger District in the Tahoe National Forest. The intent of the pilot project was to implement resource management activities described in the act, including construction of up to 300,000 acres of Defensible Fuel Profile Zones over a five-year period, which would require increased removal of biomass.

¹ Lassen, Plumas, and Sierra counties form a region that closely coincides with the area subject to the HFQLG Act. Smaller portions of Butte, Nevada, Shasta, Tehama, and Yuba counties are also within this area.

There is a general disagreement as to the consequences of increased removal of biomass. There are two claims regarding how this project will affect the local economy. The first claim is that removal of biomass will allow the forest to grow more quickly and be healthier and more resistant to disease and catastrophic wildfire, and provide an economic gain for the local area due to increased timber sales. The second claim is that increased biomass removal will result in a sparse forest that will be less attractive to recreational visitors, decrease water quality through erosion, and result in an economic loss in the area due to decreased tourism.

Because there is disagreement regarding the socioeconomic effect of this project, the Forest Service is required under the HFQLG Act to provide status reports to Congress. Section (j) (1) (D) of the HFQLG Act states that "status reports shall include at least the following."

(j) (1) (D) A description of the economic benefits to local communities achieved by implementation of the pilot project.

The analysis and conclusions contained in this report, as well as the report for fiscal years 1999 and 2000, in no way support or refute either of the two claims regarding economic benefit of the pilot project. This report only covers the analysis of money spent by the Forest Service during fiscal year 2001 on the HFQLG Act.

CED was contracted to analyze the economic benefit of fiscal year 2001 of the HFQLG Act on the local economy. The economic benefit study was limited to Lassen, Plumas, and Sierra counties (the Core Area) and to Butte, Nevada, Shasta, Tehama, and Yuba counties (the Peripheral Area). Impacts to the two regions were determined and reported separately. Therefore, the total estimated economic benefits of the HFQLG Act in fiscal year 2001 to these eight counties are considered the "mandated description of the economic benefits to local communities" stated above. There are also benefits to outlying areas that are not mandated to be monitored and, therefore, are not a part of this study. An analysis of revenue from timber sales awarded as a result of execution of the HFQLG Act, which was present in the report for fiscal year 2000, will be presented in a separate document for fiscal year 2001.

There is considerable debate as to whether the Sierra Nevada Forest Plan Amendment (SNFPA) has hindered the implementation of the HFQLG Act. Implementation of the HFQLG Act has been altered by the SNFPA. As a result, the Forest Service has changed some timber sales that produce revenue to service contracts that the Forest Service must fund. The full extent of these alterations' impacts to implementation of the HFQLG Act remains to be seen. However, comparison of the economic effects of the HFQLG Act with or without the SNFPA is the subject of another report pending in 2002. This report is intended to measure the economic impact of what was actually implemented.

Methodology

CED executed the following methodology in analyzing the economic benefit of the HFQLG Act to the Core Area. This section includes an explanation of how CED analyzed economic benefits, discussion of the model used, and the advantages and limitations of the model.

The Forest Service provided the HFQLG Act's fiscal year 2001 financial statements in two forms. First, spending summaries were provided that outlined how money was spent in several categories, including amounts spent on payroll, travel, contractual services, rents, materials, equipment, and grants to other agencies. Second, summaries were provided for the four accounting units: Lassen, Plumas, and Tahoe National Forests, and HFQLG Staff.

Each dollar of spending was attached to a particular job code assigned by the Forest Service. Some job codes covered administrative spending and others covered spending related to present and future projects. Analysis of fiscal years 1999 and 2000 included review of transaction registers for each job code. This was not provided, nor was it necessary for analysis of fiscal year 2001.

CED entered the summary spending values into a database for analysis. Totals for each job code and for each category of spending was calculated. All payroll was assumed to be spent locally and total payroll was considered the direct personal income benefit of the HFQLG Act. Other line-items were considered business-to-business transactions or business spending. Each category of spending was analyzed separately, and CED estimated the percentage of each category that was spent locally. CED assumed the following percent of HFQLG Act spending for each category: 90 percent of personnel to account for payroll minus taxes, 40 percent of travel, 100 percent of materials, and 50 percent of equipment as found in a survey of itemized spending reports from fiscal year 2000. Rent and grants were spending categories in fiscal years 1999 and 2000, but not in fiscal year 2001.

To analyze contracting services, CED acquired a list of contractors, their location of business, and amount contracted. Money to contractors located in the Core Area was considered in the economic impact analysis for the Core Area, and money to contractors located in the Peripheral Area was considered in the economic impact analysis of the Peripheral Area.

Non-contractual obligations in fiscal year 2001 were not included in this analysis. These funds were not spent in fiscal year 2001 and, therefore, cannot be considered in the HFQLG Act economic impact analysis. While Forest Service funds may not have been spent in fiscal year 2001, contractors spent funds they anticipate from the Forest Service and, therefore, should be considered in this year's analysis. Many of these contracts are for work commencing over several years. Ideally, these funds should be distributed throughout years for which the project is on-going. The project tracking and accounting system implemented by the Forest Service does not permit the collection of this data within the timeframe of the production of this report. Integration of non-contractual obligations in the economic impact analysis will be attempted in future fiscal year reports.

CED performed two separate economic analyses for the HFQLG Act in fiscal year 2001: one analysis was made on Forest Service payroll and spending in the Core Area and a second analysis was made on payroll and spending in the Core and Peripheral Areas combined from the HFQLG Act fiscal year 2001. In order to obtain peripheral area impacts, CED simply subtracted figures for the Core Area from the Core plus Peripheral Area analysis.

CED customized the economic model to reflect payroll and spending during the planning and implementation the HFQLG Act. This was done for two reasons. First, the model used does not assume any business-to-business transactions occur locally from non-military federal government (including the Forest Service) to local businesses. In other words, the model assumes there are no local purchases made by the Forest Service. Therefore, CED entered its estimates of all spending to other local industries just as the model would do if it assumed any spending to local industry by the Forest Service. It would be unreliable to factor in personal income expenditures when working with the model in this manner.

Second, personal income distribution of Forest Service employees in the model was not consistent with personal income distribution in HFQLG Act fiscal year 2001. Total income (or the annual equivalent, since most people worked on this project on a temporary basis) could be determined from the information provided by the Forest Service. Personal income data needed to be entered separately, independent from business spending.

CED entered the base data into the model in order to determine the economic benefits of the HFQLG Act fiscal year 2001 as described in the Analysis of Benefits section.

The request for proposals indicates that “[d]ata collection and analysis will be done at the community level (zip code) where possible...”. CED has determined that zip code analysis will not produce reliable or otherwise useful results. Zip code data is estimated based on zip code business pattern files from the U.S. Department of Commerce, which uses an employment range. IMPLAN uses the midpoint of each range for each industry². This data is much less reliable than county data. Many of the communities in the Core

² <http://www.mig-inc.com/KnowledgeBase/DisplayArticle.asp?KBID=20062>

Area are within commuting distance of one another, thereby creating the assumption that if employment is increased in Quincy, for example, the benefit would not be transferred to Greenville, which has a substantial number of commuters traveling to Quincy to work. In addition, creation of a separate analysis for each community would not be possible given the timeframe and resources available for this project. Analysis of community impacts will be reconsidered in economic impact and socioeconomic monitoring reports for subsequent years.

The request for proposals specified that CED consult with the Natural Resources Institute (NRI) at Fort Collins, Colorado, when applying IMPLAN to community economic analysis. CED staff did not consult with NRI since it was determined that community analysis would not be feasible. CED staff would still be willing to consult with NRI at the Forest Service's request. Prior to conducting the analysis for fiscal year 1999, CED staff did consult with Scott Lindall at Minnesota IMPLAN Group and Dr. Tom Harris, director of the University Center for Economic Development at University of Nevada, Reno, concerning the use of IMPLAN to determine local economic impacts. CED staff would be willing to consult with NRI as well at the Forest Service's request.

The Economic Model

A regional economic model was built for the Core Area using the IMPLAN economic impact analysis system. IMPLAN models the economy through pre-input matrices measuring dollar flows from industry to industry, from industries to households, and from households to industries. This is called an input-output economic model and can be used to measure how changes in spending by households or an industry produce changes in spending by all households and industries. The input-output economic model charts the flow from one industry or household to another through a matrix. A matrix is a mathematical equation that is capable of solving for multiple variables in the same matrix or equation. The theory behind this type of economic impact analysis is best provided in an example.

Assume the Forest Service spends \$100.00 directly at a local retail store. Part of that original \$100.00 is respent as payroll for the store's employees, some goes to the wholesaler or manufacturer, some may go to a property manager for rent, some may go to the government for taxes, and so on. If the employee, wholesaler or manufacturer, or property manager is located in the Core Area, that money is assumed to be respent within the Core Area and is added to the direct impact as indirect impact.

A model based on the social accounting matrix (type SAM model) was used to determine the effects of the HFQLG Act fiscal year 2001. IMPLAN's type SAM model is the most widely used model as of the date of this study. A majority of economic analysis consulting firms who work with local governments and economic development organizations use it to analyze the impact of changes to the local business structure.

Advantages of the Economic Model

There are many advantages to using the type SAM model, two of which are important enough to mention in this report. The first advantage of using IMPLAN's type SAM model is that it is capable of tracing monetary flows through debits and credits, which have become increasingly prevalent in today's economy (Minnesota IMPLAN Group, 1998). Since a majority of the money flows out of the Forest Service in the form of salary to households, the type SAM model more accurately reflects the likely spending patterns of households in the Core Area.

Second, the type SAM model considers impacts that are induced from increased household income and, therefore, increased household spending, in addition to the indirect effect of increased industry spending (Minnesota IMPLAN Group, 1998). This characteristic further adds to the accuracy of household expenditures to industries.

These factors combine to help make the type SAM model from IMPLAN the most precise tool for estimating the economic impacts of the HFQLG Act fiscal year 2001 on the Core and Peripheral Areas.

Fiscal year 2001 began in October 2000 and ended in September 2001. This study covers the benefit of spending for three months of one calendar year and nine months of the following calendar year. Economic impact analysis is measured in annual data (annual personal income and annual spending). However, economic impact analysis is not dependent upon the benefit occurring from the beginning to end of a calendar year (January through December), only that the direct benefit occurs over a year, ending the day before the same date in the following year. Therefore, benefits of the HFQLG Act fiscal year 2001 are reliably measured using IMPLAN because the fiscal years begin and end at the same time of the year (the end of September).

Limitations of the Economic Model

There are two limitations to IMPLAN's type SAM model that may affect results. CED has worked to minimize these limitations in order to obtain a more accurate estimate from the model. One limitation is the possibility of resources spent by the Forest Service outside the Core Area that are, in turn, respent within the region. This occurs most often in travel expenses, particularly with persons working on the project who live outside of the region, yet travel to the region for the project and spend money. However, the Forest Service was able to recognize and note most payments to persons outside the region for travel inside the region, which reduces the error caused by this limitation.

The second limitation results from a characteristic of all IMPLAN models, including type SAM. The proportion of an industry's spending to households and other industries is fixed. In other words, the distribution of spending before the event being measured for impact is the same as the distribution of spending after the impact. For example, if 10 percent of old Forest Service spending is to wheat farms then 10 percent of all new spending is estimated to go to wheat farms. This assumption ignores the possibility that there may be no time for local farmers to increase acres planted to meet the increased demand, even if there is land available. If additional output is demanded by an industry, all of the industry's inputs increase proportionally, and there is no supply constraints or substitutions (Minnesota IMPLAN Group, 1998). Manually entering the Forest Service's components of spending from the HFQLG Act fiscal year 2001 (payroll, travel, and purchases by industry) helps reduce this limitation considerably. The distribution of Forest Service spending before the HFQLG Act has no bearing on, and can be completely separated from, the distribution of spending from the HFQLG Act fiscal year 2001. While this does nothing to affect the same assumption in indirect spending estimates, this limitation is eliminated from the direct spending.

Economic Output Benefits

Economic output is a term used to describe the value of purchases of goods and services by intermediate and final consumers. Increases in purchases indicate increased dollar flows, particularly through businesses, which indicates more business sales. Therefore, dollars spent directly in the economy by a business, an institution, or an individual result in secondary or indirect impacts to the economy. The direct plus the indirect benefits is the total benefit to the economy.

Economic impact analysis often uses a multiplier when summarizing economic benefits. The multiplier is the ratio between the direct effect and estimated total effect on the economy:

$$\text{economic output multiplier} = \frac{\text{estimated total economic output benefit}}{\text{direct economic output benefit}}$$

In the Core Area, the estimated total economic benefit is \$42.0 million and the direct economic benefit is \$25.2 million. Dividing \$42.0 million by \$25.2 million gives the economic output multiplier of 1.67 for fiscal year 2001 spending from the HFQLG Act on the Core Area (Figure 1, Page 7). This multiplier is 0.05 lower than the fiscal year 2000 estimate of 1.72. This difference is due in part to a slightly greater percentage of contracts to firms outside of the Core Area.

Indirectly, the HFQLG Act supported \$16.9 million in economic output as the Forest Service and its employees purchased goods and services from businesses in the Core Area. These purchases often lead local businesses to purchase other goods and services locally, adding to the indirect economic output benefit.

In the Peripheral Area, \$14.3 million in total economic output was added to the economy as a result of fiscal year 2001 spending from the HFQLG Act. A multiplier for just the Peripheral Area would not be appropriate, since the direct benefit occurred in the Core Area resulting in a denominator of zero in the equation above. The multiplier is appropriately applied, however, for the Core and Peripheral Areas combined. The combined economic output benefit is \$56.3 million, resulting in a multiplier for the Core plus Peripheral areas of 2.24 (Figure 1, Page 7). Therefore, in the area overall, each \$1.00 of spending by the Forest Service in the HFQLG Act fiscal year 2001 resulted in \$2.24 in economic output in the eight counties.

Employment Benefits

A multiplier that has been used most often in the past, yet is still useful today, is the employment multiplier.³ The employment multiplier works like the economic output multiplier in that it is total benefit divided by direct benefit:

$$\text{employment multiplier} = \frac{\text{estimated total employment benefit}}{\text{direct employment benefit}}$$

An estimated total of 251 full-time equivalent (FTE) jobs were supported as a result of fiscal year 2001 spending from the HFQLG Act, which directly supported 145 FTE jobs within the Forest Service in the Core Area (Figure 1, Page 7). The remaining 106 FTE jobs were supported indirectly by the indirect increase in economic output. Dividing 145 by 251 equals 1.73, therefore, the employment multiplier for fiscal year 2001 spending from the HFQLG Act is 1.73 in the Core Area. Every FTE job created by fiscal year 2001 spending from the HFQLG Act supports and additional 0.73 FTE jobs for a total of 1.73 FTE jobs in the local economy.

This multiplier decreased from 1.99 in the fiscal year 2000 report. One reason for this is that a lesser percentage of local Forest Service spending went to payroll than in the previous fiscal year in the Core Area.

In the Peripheral Area, an estimated additional 132 FTE jobs were supported by fiscal year 2001 spending for the HFQLG Act for a total employment benefit of 383 FTE jobs in the Core and Peripheral Areas combined (Figure 1, Page 7). This results in a multiplier for the Core plus Peripheral Areas of 2.64. Every job supported by the HFQLG Act in fiscal year 2001 supported an additional 1.64 jobs in the eight-county area.

Labor Income Benefits

Another useful measure of economic impact is the increase in labor income. Labor income includes wage, salary, and proprietary income. Increases in labor income partially represent increases in the economic component of standard of living. Another component of economic standard of living, inflation or the

³ Until 1997, the employment multiplier was used more often than the output multiplier. Until 1985, employment in economic impact analysis was measured as full-time equivalent employment (Lindall & Olson, 1996). This meant that one job could be measured as one full-time job or two half-time jobs. Since then, employment has been measured as full- and part-time employment. Critics of economic impact analysis argued that employment impacts were ambiguous, meaning that the analyzer could not determine whether or not these were full-time or low-paying jobs. Therefore, economic impact analysis focuses more upon effect on total output rather than employment. Employment is usually included because it is still important as an indicator of human impact.

increase in cost of living, is not taken into account in economic impact analysis. Cost of living may or may not be growing more rapidly than labor income in the economy overall and no conclusions can be made regarding the relationship between labor income and cost of living in this analysis. Economic impact analysis intends to measure increases in labor income due to an event, in this case fiscal year 2001 of the HFQLG Act.

The Forest Service spent \$7.5 million in payroll during planning and implementation of the HFQLG Act in fiscal year 2001 (Figure 1, Page 7). Indirectly, the HFQLG Act supported \$5.4 million in labor income in the Core Area during fiscal year 2001 as a result of increases in economic output, leading to a total labor income benefit of \$12.9 million in the Core Area.

In the Peripheral Area, fiscal year 2001 spending for the HFQLG Act supported an additional \$7.8 million in labor income, resulting in \$20.6 million in labor income supported in the Core and Peripheral areas, combined.

A multiplier can be applied to labor income the same way multipliers are applied to output and employment, by dividing the direct labor income benefit by the estimated total labor income benefit:

$$\text{labor income multiplier} = \frac{\text{estimated total labor income benefit}}{\text{direct labor income benefit}}$$

The resulting multiplier for the Core Area is \$12.9 million divided by \$7.5 million, or 1.72. In the Peripheral Area, the multiplier is \$20.7 million divided by \$7.5 million, or 2.77.

Figure 1 - Economic Benefits in the Core Area of the HFQLG Act in Fiscal Year 2001

Type and Area of Benefit	Total Economic Output	Employment	Labor Income
HFQLG Act Totals (Direct Benefit)	\$ 25,162,385	145	\$ 7,466,317
Indirect Benefit, Core Area	\$ 16,868,340	106	\$ 5,388,496
Total Benefit, Core Area	\$ 42,030,725	251	\$ 12,854,813
Indirect Benefit, Peripheral Area	\$ 14,258,613	132	\$ 7,799,467
Total Benefit, Core plus Peripheral Areas	\$ 56,289,338	383	\$ 20,654,280
Core Area Multiplier	1.67	1.73	1.72
Core plus Peripheral Area Multiplier	2.24	2.64	2.77

Source: Center for Economic Development, utilizing financial data provided by the Forest Service and IMPLAN Professional economic analysis tools.

Comparison of the multipliers for employment and labor income gives insight regarding the compensation levels of jobs supported by planning and implementation of the HFQLG Act in fiscal year 2001 relative to average compensation levels in the area. If the labor income multiplier is higher than the employment multiplier, then the project is supporting jobs that pay higher than average. If the employment multiplier is higher, then jobs supported by the project pay less than the area average.

In the Core Area, the multipliers for employment and labor income are 1.73 and 1.72, respectively. Therefore, jobs supported by the HFQLG Act in fiscal year 2001 paid about average for the area. However, when the Peripheral Area is added, the multipliers for employment and labor income are 2.64 and 2.77, respectively, about a 5 percent difference. Therefore, labor income for jobs supported by the HFQLG Act in fiscal year 2001 paid about 5 percent higher in the Core and Peripheral areas combined. This is likely due to the large contract dollar amount to businesses in the Peripheral Area that tend to require a number of technicians on staff that demand higher than average salaries.

One limitation in this analysis deserves mention. Some businesses in the economic model are not classified correctly. For example, most public colleges and universities are classified under state government in the model. This explains why in Butte County, the location of California State University, Chico, the analysis shows zero impact. This institution is classified under government in the model.

CED worked around this limitation in the analysis by classifying the industries that consultants and vendors that did business with the Forest Service in Fiscal Year 2001 itself and not relying on the model's business classifications. However, when the impact of these expenditures are considered, if the industry classifications in the model are not precise, this analysis is weakened. Methodology for reducing the impact of this limitation in the analysis will be considered for subsequent fiscal year reports.

Economic Capacity

The request for proposals for the fiscal year 2001 report requested analysis of the capacities of local communities to capture economic benefits generated by the Forest Service. CED provided a table (Figure 2, Page 9) showing the various multipliers for industries by county determined to be substantially affected by expenditures of the Forest Service. The table shows the propensity of the eight counties to absorb economic output benefits from fiscal year 2001 of the HFQLG Act.

The multipliers were reported by IMPLAN in a report format. The software calculated how much economic output would increase for every dollar spent in each industry. CED reported the 20 industries that experienced the greatest economic benefit in terms of dollar value based on the model used to estimate the economic impact of the HFQLG Act fiscal year 2001 on the Core and Peripheral areas combined.

Of the top 20 industries benefiting from the HFQLG Act in fiscal year 2001, Shasta County seems most likely to absorb economic benefits with a weighted average multiplier of 2.04. Butte and Nevada counties also had high multipliers at 1.98 and 1.87, respectively. Of the Core Area counties, Plumas had the highest multiplier at 1.70, followed by Lassen County at 1.60 and Sierra County at 1.32, the lowest of all counties.

Figure 2 – Capacity of Core and Peripheral Area Counties to Absorb Economic Benefits Generated by the HFQLG Act, FY 2001

Top 20 Impacted Industries	Economic Output Benefit, Peripheral Area, FY 2001	Multipliers by County							
		Core Area			Peripheral Area				
		Lassen	Plumas	Sierra	Butte	Nevada	Shasta	Tehama	Yuba
Sawmills and Planing Mills, General	\$ 6,439,987	2.03	1.81	1.72	2.20	2.03	2.20	1.87	1.89
Research, Development, & Testing Services	\$ 2,304,452	0.00	1.67	0.00	2.05	2.02	1.99	1.61	0.00
Logging Camps and Logging Contractors	\$ 1,330,108	1.59	1.45	1.39	1.68	1.68	1.70	1.46	1.54
Owner-occupied Dwellings	\$ 1,183,066	1.91	1.69	1.58	1.96	2.00	2.03	1.60	1.83
Real Estate	\$ 1,095,467	1.92	1.71	1.56	2.05	2.03	2.09	1.61	1.85
Hospitals	\$ 938,728	1.76	1.66	0.00	1.99	1.98	2.00	1.61	1.64
Eating & Drinking Places	\$ 860,238	1.71	1.57	1.39	1.90	1.84	1.90	1.51	1.62
Doctors and Dentists	\$ 828,813	1.81	1.70	1.48	2.09	2.04	2.06	1.63	1.70
Wholesale Trade	\$ 733,846	1.83	1.69	1.52	2.06	2.01	2.02	1.61	1.74
Colleges, Universities, and Schools	\$ 709,435	0.00	1.75	1.47	0.00	0.00	2.02	0.00	1.77
Banking	\$ 635,059	1.76	1.61	1.49	1.89	1.91	1.89	1.52	1.70
Computer and Data Processing Services	\$ 610,348	1.73	1.67	1.44	2.05	1.99	1.91	1.55	1.72
Maintenance and Repair Other Facilities	\$ 561,423	1.74	1.60	1.43	1.93	1.90	1.98	1.59	1.62
Management and Consulting Services	\$ 509,303	1.73	1.70	1.46	2.01	2.02	1.99	1.60	1.62
Automotive Dealers & Service Stations	\$ 485,408	1.89	1.69	1.56	2.07	2.04	2.06	1.64	1.77
Miscellaneous Retail	\$ 478,842	1.90	1.70	1.56	2.07	2.04	2.07	1.64	1.79
New Residential Structures	\$ 478,592	1.62	1.52	1.32	1.80	1.72	1.87	1.52	1.55
Communications Except Radio and TV	\$ 388,610	1.82	1.60	1.45	1.99	1.92	1.98	1.54	1.73
Electric Services	\$ 374,441	1.81	1.63	1.54	1.93	0.00	1.94	1.56	0.00
Motor Freight Transport and Warehousing	\$ 356,719	1.89	1.67	1.35	2.08	2.03	2.10	1.71	1.78
Weighted Average	n/a	1.60	1.70	1.32	1.98	1.87	2.04	1.62	1.55

Source: Center for Economic Development and IMPLAN Professional economic analysis tools.

Common Terms

There are a number of terms used in this report that are common to economic impact analysis. The following are a list of definitions for terms used in this report.

Direct benefits: Forest Service funds that went directly to payroll and purchases to local businesses within Lassen, Plumas, and Sierra counties.

Indirect benefits: All payroll and purchases that were respent inside the Core Area as a result of spending defined in direct benefits.

Total benefits: Direct plus indirect benefits.

Economic output: Direct benefits in this category are equal to total spending from the Forest Service on payroll, travel, purchases, and contracts as a direct result of the HFQLG Act. This spending is considered to be increased output from the Forest Service, and, therefore, can be added to the indirect effect on output, resulting in a measure of total economic output. Indirect benefits are the total increase in economic output of all other businesses, institutions, and individuals in the Core Area as a result of Forest Service spending.

Employment: The total number of full- and part-time jobs in a region. Employment benefits are the estimated direct and indirect change in total employment due to Forest Service spending. Increases in economic output are used to estimate total employment benefits, using average output per job by industry as a baseline.

Labor income: The total amount of wage, salary, and proprietary income received by individuals within the region. Labor income benefits are the estimated direct and indirect change in personal income. Increases in economic output are used to estimate total labor income benefits, using labor income as a percent of output by industry as a baseline.

References

Lindall, Scott A. and Olson, Doug S. 1996. *The IMPLAN Input-Output System*. Stillwater, MN: MIG, Inc.

Minnesota IMPLAN Group. 1998. *Elements of the Social Accounting Matrix*. Stillwater, MN: MIG, Inc.

_____. 1998. *How does MIG construct IMPLAN zip code data files?* Stillwater, MN: MIG, Inc.

_____. 1999. *IMPLAN Professional Version 2.0: Social Accounting & Impact Analysis Software*. Stillwater, MN: MIG, Inc.

Silberberg, Eugene. 1990. *The Structure of Economics: A Mathematical Analysis*. New York: McGraw-Hill Publishing Company.