

# Economics

## Introduction

The management of the Flathead National Forest has the potential to affect local economies. People and economies are an important part of the ecosystem. Use of resources and recreational visitation are an important part of the ecosystem. Use of resources and recreational visitation to the Forest generate employment and income in the surrounding communities and counties and generate revenues that are returned to the Federal treasury.

This section presents concepts used to delineate an affected area and methods used to analyze the economic effects of the project, including the project feasibility, financial efficiency, and economic impacts. Project feasibility and financial efficiency relate to the costs and revenues of doing the action. Economic impacts relate to how the action affects the local economy in the surrounding area.

The NEPA requires that consequences to the human environment be analyzed and disclosed, based on issues. It does not require a monetary benefit-cost analysis. If an agency prepares an economic analysis, then one must be prepared and displayed for all alternatives [40 CFR 1502.23]. The preparation of NEPA documents is also guided by CEQ regulations for implementing NEPA [40 CFR 1500-1508].

Office of Management and Budget (OMB) Circular A-94 promotes efficient resource use through well-informed decision making by the Federal Government. It suggests agencies prepare an efficiency analysis as part of project decision making. It prescribes present net value as the criterion for an efficiency analysis.

The development of timber sale programs and individual timber sales is guided by agency direction found in FSM 2430. Forest Service Handbook 2409.18 guides the financial and, if applicable, economic efficiency analysis for timber sales.

## Data Sources, Methods, and Assumptions Used

Four measures are appropriate for the economic analysis:

1. Project Feasibility
2. Financial Efficiency
3. Economic Efficiency (if needed)
4. Economic Impacts.

**Project feasibility** is used to determine if a project is feasible – will it sell, given current market conditions. It relies on the Region One Transaction Evidence Appraisal (TEA) System. The TEA uses regression analysis of recently sold timber sales to predict bid prices. The most recent appraisal model for the area of interest was used to estimate the stumpage value (expected high bid resulting from the timber sale auction) for the timber rates (revenues considered essential to cover regeneration plus minimum return to the Federal treasury) for that alternative. The project is considered feasible if the estimated stumpage value exceeds the base rates. If the feasibility analysis indicates that the project is not feasible (estimated stumpage value is less than the base rates), the project may need to be modified. The infeasibility indicates an increased risk that the project may not attract bids and may not be implemented.

**Financial efficiency** considers anticipated costs and revenues that are part of Forest Service monetary transactions. Present net value (PNV) is used as an indicator of financial efficiency and presents one tool to be used in conjunction with many other factors in the decision-making process. Present net value combines benefits and costs that occur at different times and discounts them into an amount that is equivalent to all economic activity in a single year. A positive PNV indicates that the alternative is financially efficient.

**Economic efficiency** uses the cost and revenue estimates included in the financial analysis and adds other economic costs and benefits that are not part of Forest Service monetary transactions. This analysis considers the quantifiable market and non-market benefits and costs associated with implementing each alternative. As with financial efficiency, a PNV is calculated to determine efficiency. An example of a non-market benefit or cost is an increase or decrease in recreation. A value for recreation visitor use would be derived from local or regional studies. An economic efficiency analysis is not required (FSH 2409.18), and would only be included in this analysis if it was public issue and there are predicted changes to quantifiable non-market benefits or costs from the project.

Many of the costs and benefits associated with a project are not quantifiable. For example, the benefit to wildlife from habitat improvement from a project is not quantifiable. These costs and benefits are described qualitatively, in the indicated resource sections of this document. Title 40, Code of Federal Regulations for NEPA (40 CFR 1502.23) indicates:

“For the purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are qualitative considerations.”

Management of the forest is expected to yield positive benefits, but not necessarily financial benefits. Costs for various vegetation, recreation, wildlife, road, and burning activities are based on recent experienced costs and professional estimates. Non-harvest related costs are included in the PNV analysis, but they are not included in appraised timber value.

**Economic impacts** are used to evaluate potential direct, indirect, and cumulative effects on the economy. Economic impacts are estimated using input-output analysis. Input-output analysis is a means of examining relationships within an economy, both between businesses and between businesses and final consumers. It captures all monetary market transactions for consumption in a given time period. The resulting mathematical representation allows one to examine the effect of a change in one or several economic analysis. IMPLAN translates changes in resulting changes in economic effects, such as labor income and employment of the affected area's economy. The IMPLAN modeling system allows the user to build regional economic models for one or more counties for a particular year. The Regional Model for this analysis used the 2006 IMPLAN data.

The economic impact effects are measured by estimating the direct jobs and labor income generated by the:

1. Processing of the timber volume from the Hemlock Elk Project, and
2. Dollars resulting from any restoration activities associated with the project into the local economy affected by the treatments proposed.

The direct employment and labor income benefit employees and their families and, therefore, directly affect the local economy. Additional indirect and induced, multiplier effects (ripple effects) are generated by the direct activities. Together the direct and multiplier effects comprise the total economic impacts to the local economy. The data used to estimate the direct effects from timber

harvest is information provided by the University of Montana's Bureau of Business and Economic Research. The economic effects tied to restoration activities and the multiplier effects (of both timber harvest and restoration activities) were estimated using IMPLAN.

Potential limitations of these estimates are the time lag in IMPLAN data and the data intensive nature of the input-output model. Significant changes in economic sectors since the latest data for IMPLAN have been adjusted using information from the University of Montana's Bureau of Business and Economic Research.

## Analysis Area

Timber management activities within the project area have the potential to affect the economic conditions of local communities and counties. To estimate the potential effects on jobs and income, a zone of influence (or impact area) was delineated. Counties were selected based on commuting data suggesting a functioning economy and where the timber is likely to be processed (log flows). Recent data on log flows from the Flathead National Forest was provided by the University of Montana's Bureau of Business and Economic Research. The zone of influence for this project is comprised of Missoula and Lake Counties in Montana.

A Plan Set of Documents (Social Science and Economic Specialist Report available at <http://www.fs.fed.us/r1/wmpz/documents/proposed-plans-fnf-psd.shtml>) exist for the Flathead Forest Plan Revision. These documents provide a description of the employment, income, and social composition of the counties comprising the analysis area and the impact on each county from management of the Flathead National Forest.

## Affected Environment

### The Economic Community

The Flathead National Forest includes parts of six Montana counties: Flathead, Lincoln, Lake, Missoula, Powell, and Lewis and Clark. About three-fourths of the area of the Flathead National Forest and most of the economic effects of Flathead National Forest programs and projects occur in Flathead County. The Forest has lesser effects in Lake County and Missoula Counties and only minimal effects in the other three counties. Both Missoula County and Lake County have community fire plans. The Seeley Swan Fire Plan covers that portion of Missoula County lying within the Hemlock Elk Project Area. The proposed actions of this project are consistent with treatments outlined in those plans for protection of homes, and private property.

### Timber Industry Trends

**Historical Production and Capacity:** Historically, annual timber harvest from NFS lands in Montana peaked at greater than 800 million board feet at the end of the 1960s. In the period of 2000 to 2004, the timber harvest dropped to the general vicinity of 100 million board feet per year or slightly greater than 10 percent of the past peak level (USDA Forest Service 2004).

In 1998, of the 293 million board feet of timber delivered to processing facilities in Flathead County, approximately 38 million board feet, or less than 13 percent, came from NFS lands (Keegan et al 2001).

Since 1980, Flathead County has had the largest wood products manufacturing industry of any county in Montana. Since 1976, the county's capacity to process saw timber has varied from a low of 265 million board feet (Scribner rule) at the present to a high of 395 million board feet in 1983. Actual saw timber processed since 1976 has varied from a low of 185 million board feet in 1982 to a high of

332 million board feet in 1988. Processing facilities utilization capacity has varied from a low of 51 percent in 1982 to a high of 97 percent in 1999. The year 2000 (the last year for which there is data) was at 94 percent of capacity. The plywood industry in Montana is presently at 93 percent of plant capacity. County level information on the plywood industry is generally not available because of data disclosure constraints (Keegan et al. 2001). However, lumber mills at Seeley Lake, and Ronan in Missoula County use timber from the Flathead National Forest as do smaller log home, and other custom wood products operations in both Lake and Missoula Counties.

The percentage of milling capacity that is actually used or remains available for use affects the demand for logs and is a variable effects log prices, which in turn, affects the quality of logs supplied to mills.

**Timber Industry Outlook:** After low levels during the first six months of 2003, wood products prices increased substantially through the summer of 2004 and have remained steady through the end of 2005, reaching their highest levels since the late 1990s (Project File Exhibit O-1). The upward surge in prices was attributable to a number of factors including increased domestic lumber consumption, a weaker U.S. dollar with fewer imports, and increased foreign demand. During 2006, most wood product prices saw a sharp decrease due to a decline in the U.S. housing market. Prices fell even further in 2007, based on information from the Western Wood Products Association and the Bureau of Business and Economic Research at the University of Montana. The first half of 2007 saw wood produce prices dropping 25 percent compared to the same period in 2006, due to further declines in the housing market (Project File Exhibit O-2).

The estimated total sales value of the state's primary wood and paper products in 2004 was \$1.2 billion, substantially more than in 2003. Despite the high prices in the second half of the year, mill closures, raw log availability, as well as other production cut backs led to reduced production, employment and wages for the year. At the end of 2004, estimated total employment in the wood products industry was about 9,100 workers, down about 100 from the previous year, and worker earnings adjusted for inflation were slightly higher. Lumber production in the state in 2004 was estimated at 1 billion board feet, down slightly from 1.07 billion board feet in 2003. Mirroring conditions in the housing industry, the log home industry experienced increased sales, reversing a downward trend. The first half on 2007 experienced decreased lumber prices, thought to be somewhat based on reduced housing starts. Log prices, even in the face of reduced lumber prices have remained high, likely due to a limited available supply of logs.

Because of a decade-long decrease in Federal timber harvest, timber availability remains a major issue for Montana's forest products industry even as wood products markets improve in the longer-term. Salvaged timber from burned areas could increase the volume of available timber. Recent work done by the University of Montana researchers indicates that millions of acres of timberlands in the state are in need of ecosystem and fire hazard treatment and could provide – as a profitable by-product – a sustainable flow of timber considerably above current harvest levels (Keegan and Morgan 2005).

## Environmental Consequences

The following effects indicators were used to focus the economic analysis and disclose relevant environmental or social effects:

- Effects of Employment
- Effect on Labor Income
- Effects on Financial Efficiency

## Project Feasibility

The estimation of project feasibility was based on a transaction evidence appraisal model, which took into account logging system, timber species, and quality, volume removed per acre, lumber market trends, costs for slash treatment, and the cost of winter logging, temporary roads, and road maintenance. The estimated high bid was compared to base rates (revenues considered essential to cover regeneration plus minimum return to the Federal Treasury). The estimated high bid and base rates for each alternative are displayed in Table 3-61 below. The estimated high bids for Alternatives 2, 3, and 4 are well above the adjusted base rates, indicating that the project is likely to be feasible. The revenue estimates from the feasibility analysis are used in the financial efficiency analysis discussed below.

## Financial Efficiency and Economic Feasibility

The financial efficiency analysis is specific to the timber harvest and ecosystem management activities associated with the alternatives (as directed in FSM 2400-Timber Management and Guidance found in the FSH 2409.18). Costs for sale preparation, sale administration, regeneration, and ecosystem restoration are included. Interdisciplinary Team Project Specialists and other Resource Specialists developed all costs, timing, and accounts. The expected revenue for each alternative is the corresponding predicted high bid from the transaction evidence appraisal equation. The PNV was calculated using Quicksilver, a program for economic analysis of long-term, on-the-ground resource management projects. A 4 percent discount rate was used over the 10-year project lifespan (2009 to 2018). For more information on the values or costs, see the project pile.

This analysis is not intended to be a comprehensive benefit-cost or PNV analysis that incorporates a monetary expression of all known market and non-market benefits and costs that are generally used when economic efficiency is the sole or primary criterion upon which a decision is made. Many of the values associated with natural resource management are best handled apart from, but in conjunction with, a more limited benefit-cost framework. These values are discussed throughout this document, for each resource area.

Changes to resources like fisheries and wildlife habitat have been measured using changes to habitat conditions and will not be described in financial or economic terms for this project. See the Fisheries and Wildlife Sections of this document. Planning costs were not included in any of the alternatives since they are sunk costs at the point of alternative selection.

Table 3-61 summarizes the project feasibility and financial efficiency, including the base rates, predicted high bid (or estimated stumpage value), total revenue and PNV for each alternative. Because all costs of the project are not related to the timber sale, two PNV's were calculated. One PNV indicates the financial efficiency of the timber sale, including all costs and revenues associated with the timber harvest and required design criteria. A second PNV includes all costs for each alternative, including other activities that are non-timber harvest related.

Table 3-61 indicates that all action alternatives are financially efficient for the timber sale. Alternative A (No Action Alternative) has no costs or revenues associated with it. Of the action alternatives, Alternative B has the highest timber sale PNV at \$139,068. The PNV for the action alternatives for the timber sale plus Resource Enhancement Project costs is -\$9,326 for Alternative B, -\$20,815 for Alternative C, and -\$45,940 for Alternative D. Alternative B yields higher revenue than does Alternatives C because of the winter logging requirement, and Alternative D because of the lack of regeneration harvest and amount of volume associated with the alternative.

A reduction of financial PNV in any alternative as compared to the most efficient solution is a component of the economic trade-off, or opportunity cost, of achieving that alternative. Alternative A would not harvest, plant trees, or take other restorative actions, and therefore, incur no costs. As indicated earlier, many of the values associated with natural restoration management are non-market

benefits. These benefits should be considered in conjunction with the financial efficiency information presented here. These non-market values are discussed in the various resource sections found in this document.

**TABLE 3-61.  
 PROJECT FEASIBILITY AND FINANCIAL EFFICIENCY SUMMARY (2008 DOLLARS)**

Category	Measure	Alternative B	Alternative C	Alternative D
Commercial Harvest Information	Acres	739	739	663
	Volume (CCF)	5724	5724	4217
	Adjusted Base Rates	\$36.86	\$36.86	\$0.00
	Estimated High Bid (\$/CCF)	\$64.15	\$62.22	64.15
	Total Revenue	\$367,195	\$356,147	\$270,520
Timber Harvest	PNV (\$)	\$139,068	\$127,579	\$102,455
Timber Harvest and *Resource Enhancement Projects	PNV (\$)	-\$9,326.15	-\$20,815	-\$45,940

\* These projects are not necessary to mitigate impacts of the Proposed Action, but are specific resource enhancements within the project area that would be beneficial to a variety of resources. If funding were not available, the improvements from these projects would not be accomplished.

When evaluating trade-offs, the use of economic measures is one tool used by the decision maker in making the decision. Many things cannot be quantified, such as effects on wildlife, impacts on local economies, the restoration of watersheds and vegetation. The decision maker considers many factors in making the decision.

One of the factors that should come into account is the relationship of fuels reduction activities and how much this costs and the relationship or benefits this has on lowering the risk of a severe and intense wildfire, improving the ability to initial attack and control fires, helping to protect human life by providing a safer environment for the firefighters and the public should a fire occur, and protecting identified human and natural resource values in the event of a future wildfire. While costs of fuels reduction activities has been identified and included in the PNV analysis above, the benefits have not been quantitatively described (other than revenues that may be realized from the sale of commercial products). This is because of difficulties in calculating values related to land and property, both on private, state, and Federal government ownerships -- values related to human life; and values related to recreation, tourism, wildlife, timber, etc.

However, economic benefits from fuels reduction activities can be described qualitatively in several ways. Reducing the potential of a severe and intensive wildfire, in general, could reduce potential wildfire suppression costs. There is a considerable range for suppression costs depending on the variety of conditions in which the fire exists, but generally fires found within the WUI that become of sufficient size can become more complex and costly.

**Economic Impact Effects (Jobs and Labor Income)**

Timber production from the Hemlock Elk Project would have direct and indirect effects on local jobs and labor income. The Forest used an input-output model, IMPLAN Analysis for Planning, to estimate effects on employment and labor income within the zone of influence (impact area).

For timber harvest, the direct employment and labor income response coefficients (e.g., jobs and labor income per million cubic feet) were derived by the University of Montana’s Bureau of Business and Economic Research. The indirect and induced multiplier effects were estimated using the IMPLAN model for the economic impact area.

For restoration and reforestation activities, the direct, indirect, and induced effects were derived using IMPLAN. The resulting direct, indirect, and induced employment and labor income coefficients have been incorporated into a spreadsheet developed by the Regional Economist for the USDA Forest Service, Northern Region.

The analysis calculated the jobs and labor income associated with timber harvest, reforestation, and restoration activities. In order to estimate jobs and labor income associated with reforestation and restoration activities, expenditures for these activities were developed for each alternative as displayed in Table 3-62.

**TABLE 3-62.**  
**REFORESTATION AND OTHER RESTORATION ACTIVITY EXPENDITURES BY ALTERNATIVE**  
**OVER A 5-YEAR PERIOD (2008 DOLLARS)**

Reforestation/Restoration Activity	Alternative B	Alternative C	Alternative D
Hand Planting	\$81,200	\$81,200	\$0
Thin from Below – Non-Commercial	\$3,500	\$3,500	\$3,500
Weed Spraying	\$13,803	\$13,803	\$13,803
Resource Enhancement Project #1		\$12,000	
Resource Enhancement Project #2		\$2,000	
Resource Enhancement Project #3		\$5,000	
Resource Enhancement Project #4		\$30,000	
Resource Enhancement Project #5		\$10,000	
Resource Enhancement Project #6		\$30,000	
Resource Enhancement Project #7		\$3,000	
Resource Enhancement Project #8		\$1,000	
Resource Enhancement Project #9		\$5,000	
Noxious weed spraying on roads not included on haul routes		\$1,933	

\*Tree planting includes cost of seedlings, planting, contract administration and site prep.

Table 3-63 displays both direct and total estimates for employment (part and full time) and labor income that may be attributed to each alternative. Since the expenditures occur over a 5-year period, the estimated impacts of jobs and labor income would be spread out over the life of the project. Most of the timber harvest and wood processing jobs would occur over the first 3 years of the project. These are not new jobs or income, but rather jobs and income that can be attributed to this project.

**TABLE 3-63.**  
**TOTAL EMPLOYMENT AND INCOME (2008 DOLLARS) OVER THE LIFE OF THE PROJECT**

Reforestation/Restoration Activity	Alt. A	Alternative B	Alternative C	Alternative D
Direct Employment	0	25.1	25.1	18.5
Total Employment	0	58.8	58.8	43.3
Direct Labor Income (Thousands of Dollars)	\$0	\$774.1	\$774.1	\$570.4
Total Labor Income (Thousands of Dollars)	\$0	\$1,476.4	\$1,476.4	\$1,087.9

### Definitions

- Employment is the total full and part-time wage, salaries, and self-employed jobs in the region.
- Labor income includes the wages, salaries, and benefits of workers who are paid by employers and income paid to proprietors.

Estimates in Table 3-63 indicate that Alternatives B and C would maintain the highest number of jobs and labor income. Alternative D maintains slightly fewer jobs. Alternative A maintains no jobs or income because there are no activities associated with this alternative.

The analysis assumes the timber volume processed would occur with the Flathead zone of influence. However, if some of the timber were processed outside the region, then a portion of the jobs and income would be lost by this regional economy.

### Alternatives B, C, and D Cumulative Effects

Management of the Flathead National Forest has an impact on the economies of local counties. However, there are many additional factors that influence and affect the local economies, including changes to industry technology, management of adjacent national forests and private lands, economic growth, and international trade.

Cumulative economic effects would be seen within the local community as a result of the ongoing and reasonably foreseeable projects on the Flathead National Forest that may affect local economics include, but are not limited to, the following:

- Belton Fuels Reduction Project
- Cooney McKay Forest Health and Fuels Reduction Project
- Sheppard Creek Fire Salvage
- Blacktail Bill Forest Health and Fuels Reduction Project
- Spotted Bear Roadside Salvage

The jobs and labor income associated with timber harvest, restoration and reforestation activities in the action alternatives, especially Alternative B, would contribute to the stability of the local economy during the life of the Hemlock Elk Fuels Reduction and Forest Health Project.

## Regulatory Framework and Consistency

Forest Plan direction is to provide a sustained yield of timber products that is cost effective and responsive to the needs of the local economy (USDA Forest Service, 1985). Alternative A would not be consistent with this Forest Plan direction. The action alternatives offer varying levels of commercial harvest and are consistent with being responsive to the needs of the local economy.

### Civil Rights and Environmental Justice

None of the action alternatives are expected to negatively affect the civil rights of consumers, minority groups, low-income groups, women, or Indian tribes. Subsistence activities would not be disproportionately reduced for any of the identified groups. The Flathead Indian Reservation is 50 miles from the project area. The effect of the action alternatives on wildlife that may be used for subsistence is discussed in the wildlife section of this chapter. No environmental health hazards are expected to result from implementation of any alternative. Income levels in Flathead County are slightly higher than average for the state of Montana, but 87 percent of the national average (U.S. Department of Commerce 2006). This project should not disproportionately affect one income group over another (Project File Exhibit O-2).

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