# Carbon Storage

***Key Points***

- The PRMP and all alternatives would increase total carbon storage from current levels, ranging from 507 million tonnes in Alternative 3, to 596 million tonnes in the No Action Alternative in 2106.
- None of the alternatives would result in carbon storage of more than 1% of the current carbon stored in forests and harvested wood in the United States or 0.02% of current global carbon storage in vegetation, soil, and detritus.

Forest management activities, including timber harvest, prescribed burning, and biomass recovery, can result in losses of on-site carbon storage. Some losses move carbon from on-site carbon storage to off-site carbon storage: for example, timber harvest transfers some of the carbon in live trees to harvested wood products. Some losses may constitute substitution of one carbon loss for another: for example, biomass recovery for electricity generation may displace electricity generation from coal. Some losses may prevent potentially greater carbon losses: for example, prescribed burning for fuels reduction may reduce the risk of wildfire, causing much larger losses of carbon than the prescribed burning.

Several studies have inventoried carbon storage in forests at broad spatial scales and described trends, but have not attempted to model future effects of different forest management strategies on carbon storage (EPA 2007, Woodbury et al. 2007, Brown et al. 2004, Law et al. 2004, Smith and Heath 2004). Some studies have modeled carbon storage under different forest management practices, but over much smaller areas than this planning area (Baskent et al. 2008, Hoover and Stout 2007, Hoover et al. 2000). To model carbon storage under different forest management strategies at the scale of the planning area requires greatly simplifying assumptions and involves substantial areas of uncertainty in the analytical results, as described in Chapter 3 – *Carbon Storage.* Additional information on this analysis is provided in *Appendix C- Carbon Storage Modeling*.

Under the PRMP and all alternatives, total carbon storage would increase over time from current levels. See *Table 4-6 (Total Carbon Storage by Alternative)* and *Figure 4-20 (Total Carbon Storage by Alternative)*. The No Action Alternative would result in the greatest increase in total carbon storage. In the first 50 years, Alternative 2 would result in the least increase in total carbon storage, but Alternative 3 would result in the least carbon storage of all alternatives by 2106. The greatest difference among the alternatives in total carbon storage – between the No Action Alternative and Alternative 3 in 2106 – would be 15%. The reference analysis of No Harvest would result in a greater increase in total carbon storage than any of the alternatives. By 2106, No Harvest would result in total carbon storage that would exceed the carbon storage under average historic conditions. This is consistent with previous text in this chapter (under *Forest Structure and Spatial Pattern*), which concluded that No Harvest would result in more mature and structurally complex forest in 2106 than average historic conditions. The reference analysis of Intensive Management on Most Commercial Timber Lands would result in a decrease in total carbon storage for the first 50 years. The total carbon storage under Intensive Management would increase from 2056 to 2106, but would still remain lower than current levels.

The annual increase in carbon storage under all alternatives over the next 100 years would represent less than 1% of the current increase in carbon storage in forests and harvested wood nationally, ranging from 0.4% under Alternative 3, to 0.9% under the No Action Alternative. As described in *Carbon Storage* in *Chapter 3*, forest management in the United States currently represents an annual accumulation of 191 million tonnes of carbon. The No Action Alternative would average an annual accumulation of 1.69 million tonnes of carbon over the next 100 years, the highest of the alternatives. Alternative 3 would average an annual accumulation of 0.79 million tonnes of carbon over the next 100 years, the lowest of the alternatives. The PRMP would average an annual accumulation of 0.96 million tonnes of carbon over the next 100 years.

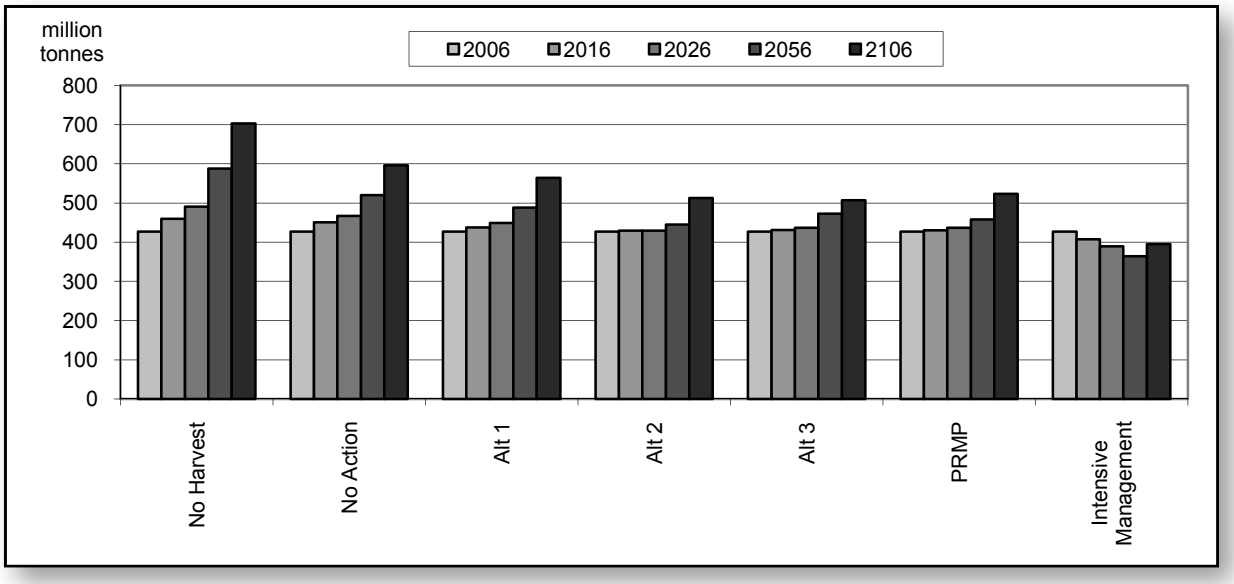
**Table 4-6.** Total Carbon Storage By Alternative

| Year | Carbon (million tonnes) | | | | | | |
|---|---|---|---|---|---|---|---|
| | No Harvest | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP | Intensive Management |
| 2006 | 427 | 427 | 427 | 427 | 427 | 427 | 427 |
| 2016 | 459 | 450 | 437 | 429 | 431 | 430 | 407 |
| 2026 | 491 | 467 | 449 | 429 | 437 | 437 | 389 |
| 2056 | 588 | 520 | 488 | 445 | 473 | 458 | 364 |
| 2106 | 703 | 596 | 564 | 513 | 507 | 523 | 395 |

In general, the lower the harvest level in an alternative, the more carbon that would stored in live trees and forests (other than live trees), and the less carbon that would be stored in harvested wood, as described in detail below. The carbon stored in harvested wood would be insufficient to offset the difference in carbon stored in the forest following harvest. Nevertheless, all alternatives would result in an increase in total carbon storage, in large part because all alternatives would increase the abundance of mature and structurally complex forest, which store more carbon than young or stand establishment forests (*see Carbon Storage* in *Chapter 3*). By 2106, the No Action Alternative would result in total carbon storage 3% higher than average historic conditions. By 2106, the other alternatives would store slightly less carbon than average historic conditions, ranging from 2% less under Alternative 1, to 12% less under Alternative 3. Despite these differences in the absolute values for the alternatives, all of the alternatives would continue to constitute 1% of the total carbon currently stored in forests and harvested wood in the United States and 0.02% of total carbon currently stored in vegetation, soil, and detritus globally. Therefore, the difference in carbon storage among the alternatives over time is too small to reveal a difference when placed in the context of nationwide or global carbon storage.

As described in *Chapter 3*, quantitative expressions of uncertainty are not available for most of these estimations of future carbon pools. Brown et al. (2004) estimated total error in describing current carbon storage and trends in California forests at 39%. The EPA (2007) estimated total error in describing current carbon storage and trends in forest ecosystems nationwide at 31-32%. The analysis here uses detailed forest inventory data to estimate current carbon in live trees, which would have less error than the procedures used in Brown et al. (2004) and EPA (2007). However, the estimation of total error from both of these sources

**Figure 4-20.** Total Carbon Storage By Alternative



does not include sources of error associated with modeling future changes to forest carbon in response to the alternatives. The greatest source of error associated with this estimation is from the analysis of carbon stored in forests (other than live trees), as described below. Overall, the total error associated with these estimations, although it cannot be precisely quantified, is greater than the difference among the alternatives.

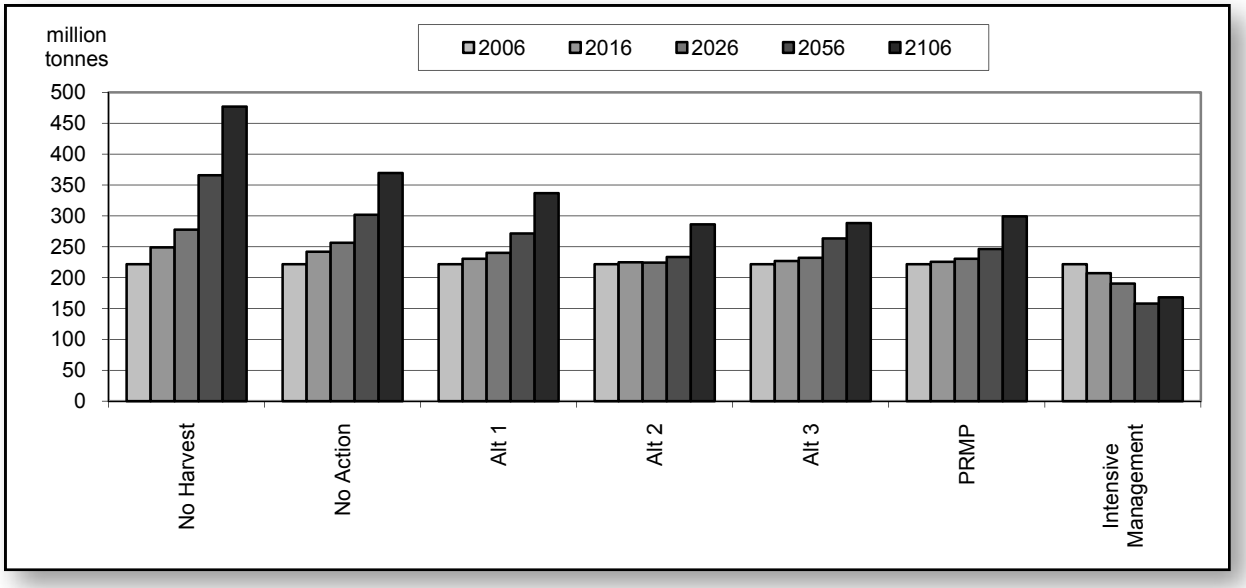
The PRMP and alternatives vary in the proportion of stored carbon in each of three carbon pools described in Chapter 3 – *Carbon Storage*:

- live trees
- forest carbon other than live trees
- harvested wood

Under the PRMP and all alternatives, the carbon storage in live trees would increase over time from current levels, similar to total carbon storage. See *Figure 4-21 (Carbon Storage in Live Trees)*. In general, the lower the harvest level, the more carbon would be stored in live trees over time. However, Alternative 3 does not fit this overall pattern. Alternative 3 has a lower harvest level than Alternative 2 or the PRMP, but would result in less carbon storage in live trees, because the extensive use of partial harvest in Alternative 3 would result in slower tree growth rates after harvest and less efficient accumulation of carbon per acre than the regeneration harvest in the other alternatives. Additionally, Alternative 3 would have the least accumulation of carbon in live trees in the nonharvest land base of any of the alternatives, because it would allocate the fewest acres to the nonharvest land base of any alternative. As with total carbon storage, the No Harvest reference analysis would result in more carbon storage in live trees than any alternative, and the Intensive Management reference analysis would decrease the carbon storage in live trees over time.

The carbon storage on BLM-administered non-forest lands is calculated based on carbon values from Brown et al. (2004) for shrublands and woodlands and does not vary by alternative or over time, as noted in *Chapter 3*. The carbon in non-forest lands is added to the carbon in forests (other than live trees). Carbon storage in forests on BLM-administered lands in eastern Klamath Falls Resource Area is calculated based on carbon values from Smith et al. (2006) for Pacific Northwest East forest types. Because structural stage development is not modeled for these eastern Klamath Falls Resource Area lands in this environmental impact statement, the live tree carbon on these forests does not vary by alternative or over time and is added to the carbon in forests (other than live trees).

**Figure 4-21.** Carbon Storage In Live Trees



As explained in Chapter 3, this analysis models carbon stored in forests (other than live trees) using regional average values from DOE (2007) and Smithwick et al. (2002) for each structural stage. As noted by Smith et al. (2006), these regional average values reflect the current best available data for developing regional estimates, but these values do not account for variation among forest stands within these structural stages. Modeling future carbon storage in forests (other than live trees) under the PRMP and alternatives requires greatly simplifying assumptions and involves substantial areas of uncertainty in the analytical results. Accurate and precise modeling of future dead wood levels under the PRMP and alternatives is not possible at this scale of analysis (see *Chapter 4*, *Forest Structure and Spatial Pattern*). The PRMP and alternatives would likely alter future levels of plants other than trees and litter levels as a result of timber harvesting, site preparation, and prescribed burning (Long and Turner 1975). However, there is incomplete information to quantify such effects through direct modeling at the planning area scale. There is inadequate information to quantify the effects of the alternatives on soil organic carbon (Birdsey et al. 2006). As noted by EPA (2007):

> "*An important source of uncertainty is that there is little consensus from available data sets on the effect of land-use change and forest management activities (such as harvest) on soil [carbon] stocks … Because soil [carbon] stocks are large, estimates need to be very precise, since even small relative changes in soil [carbon] sum to large differences when integrated over large areas*." (EPA 2007: 7-11).

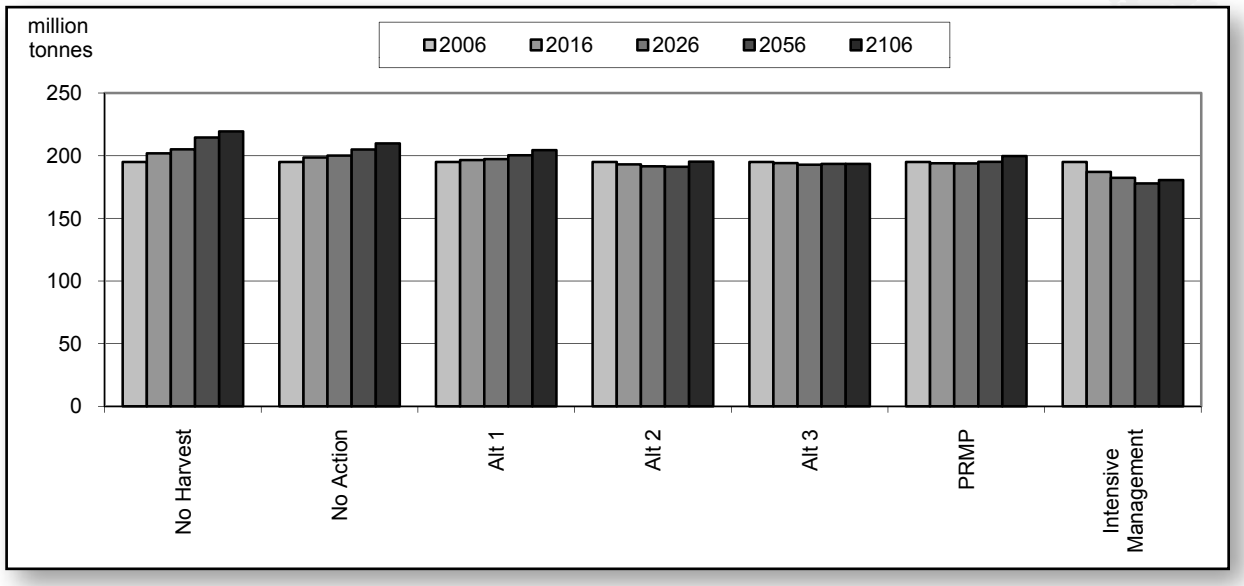
These values for carbon stored in forests (other than live trees) also do not account for variation among forest stands of the same structural stage that would result from variation among the alternatives. For example, the PRMP and Alternatives 1 and 2 include management direction for retention and creation of snags and coarse woody debris when thinning in Late-Successional Management Areas. This management practice would result in more carbon in dead wood than in otherwise similar stands that would not be thinned in the Late-Successional Management Areas or in other land use allocations. However, this variability is not reflected in these values, because the analysis cannot directly model these pools of carbon and instead must rely on regional average values.

The amount of carbon stored in forests (other than live trees) generally reflects the structural stage distribution that results under each alternative. See *Figure 4-22 (Carbon Storage in Forests Other Than Live Trees)*. The No Action Alternative would result in the most carbon storage in forests (other than live trees) of all alternatives, because it would harvest the least existing old forest and would create the least stand establishment forests. Alternative 3 would result in the least carbon storage in forests (other than live trees) in 2106, because it would harvest the most existing old forest and create the most stand establishment forest by 2106. The PRMP would result in more carbon storage in forests (other than live trees) than Alternatives 2 or 3, but less than the No Action Alternative or Alternative 1. The No Harvest reference analysis would result in more carbon stored in forests (other than live trees) than any of the alternatives, because it would harvest no existing old forest and eventually eliminate stand establishment forests. The Intensive Management reference analysis of intensive management on most commercial timber lands would decrease the carbon stored in forests and result in the least carbon stored in forests (other than live trees). Nevertheless, the greatest difference in outcome among the alternatives is 8% between the No Action Alternative and Alternative 3 in 2106, which is less than the total error associated with the analysis of carbon storage in forests (other than live trees). See the *Carbon Storage* section of *Chapter 3*.

For modeling the future carbon storage in harvested wood under each alternative, carbon storage in harvest wood can be divided into:

- wood products in-use
- wood products in landfills
- wood burned for energy production
- carbon emitted (wood decayed or burned without energy production)

**Figure 4-22.** Carbon Storage In Forests Other Than Live Trees




Harvested wood burned for energy production displaces the use of other carbon-emitting fuel sources, which distinguishes it from carbon emitted through decay or burning without energy production (Smith et al. 2006).

This analysis includes all harvested wood for each alternative. The conversion from harvested wood volume to carbon mass is used for softwood lumber from Smith et al. (2006, 35). Values for the portion of carbon in harvested wood that is in products in use, landfills, burned for energy, and emitted are derived from DOE (2007) and Smith et al. (2006). These values describe the change in these proportions over time since harvest. This analysis also includes the continued storage of carbon in wood harvested in harvests from 1962-2005, which is described in detail in Chapter 3 – *Carbon Storage*. The values from DOE (2007) and Smith et al. (2006) only address the portion of carbon in various pools for 100 years after harvest. This analysis treats the carbon stored in wood from past harvests as if it had been harvested in 2006 to provide an estimation of the change in carbon storage for the duration of the analysis period. This underestimates the carbon storage in wood from past harvests, because a much larger portion of carbon in harvested wood is lost in the first decade after harvest than in later decades (DOE 2007; Smith et al. 2006). See *Figure 4-23 (Carbon Storage in Harvested Wood from Past and Future Harvests)*. However, there is no information on which to model carbon storage more than 100 years after harvest.

Estimating carbon storage in harvested wood necessarily involves broad generalizations and some speculation about the use of harvested wood, which may change over time. Brown et al. (2004) estimated the error associated with calculating carbon storage in harvested softwoods in California at 10.8%. The EPA (2007) estimated the error associated with calculating carbon storage in harvested wood nationwide at 24-26%.

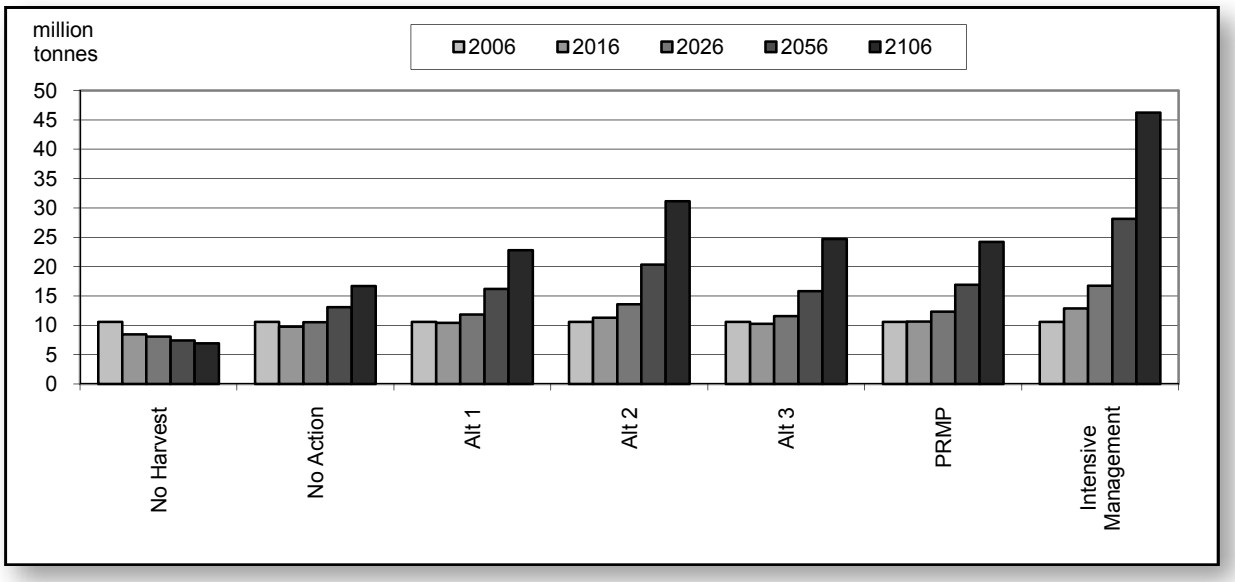
The total amount of carbon stored in harvested wood reflects the overall amount of timber harvest under each alternative. See *Figure 4-23 (Carbon Storage in Harvested Wood from Past and Future Harvests)*. The No Action Alternative would result in the least carbon stored in harvested wood, and Alternative 2 would result in the most carbon stored in harvested wood of all alternatives. Under the No Harvest reference analysis, the carbon stored in harvested wood would decrease over time, because there would be no future harvests, and the carbon stored in wood from past harvests would continue to decrease over time. The Intensive Harvest reference analysis would result in more carbon stored in harvested wood than any of the alternatives.

The carbon stored in wood harvested from BLM-administered lands would range from 2% to 6% of the total amount of carbon stored in forests on BLM-administered lands and wood harvested from BLM-administered lands. This is generally consistent with the national assessment that found that the carbon stored in harvested wood represents a pool approximately 5% of the total carbon stored in forests and harvested wood (EPA 2007, p. 7-7). In the Intensive Management reference analysis, carbon stored in harvested wood would increase to 12% of total carbon stored in forests and harvested wood by 2106.

There are other sources of uncertainty with these estimations of future carbon storage beyond the uncertainties associated with descriptions of carbon values for each storage pool. Carbon stored in forests may be released as a result of wildfire. As described later in this chapter (under *Incomplete and Unavailable Information, Salvage After Natural Disturbance)*, this analysis cannot estimate future broad-scale disturbances, such as wildfire. Furthermore, the amount of carbon lost from wildfire is highly variable (Page-Dumroese and Jurgensen 2006, Brown et al. 2004). Therefore, it is not possible to quantify the effect of future disturbances on forest carbon pools. Nationally, wildfire has recently resulted in carbon release that varies widely from year to year, but generally has been a loss of 0.05% - 0.10% of the total carbon stored in forests (EPA 2007). However, effects could range much higher in some years at the regional scale (Law et al. 2004). Brown et al. (2004) calculated that fire has recently been the dominant cause of carbon emissions from California forests, greater than total emissions from timber harvest. Forest management activities undertaken to reduce fire hazard or severity, such as prescribed burning, may result in reductions in carbon storage at the stand scale. However, by reducing the frequency and intensity of future fires, such fuels management could maintain higher carbon storage in the long term (Krankina and Harmon 2006).

It is not possible to quantify future changes in carbon storage on other ownerships in the planning area. As explained in previously in this chapter (see *Forest Structure and Spatial Pattern)*, it is not possible to conduct comparable modeling of future vegetation conditions and timber harvesting on lands other than the BLM-administered lands. Analysis of vegetation condition relies on simple assumptions about future vegetation conditions on other lands. The environmental impact statement assumes that all forest-capable lands in the U.S. Forest Service late-successional reserves, administratively withdrawn, and congressionally reserved lands would develop through the structural stages according to broad assumptions. However, these simple assumptions about future condition of these U.S. Forest Service lands require combining mature and structurally complex forests together. Any attempt to calculate carbon storage based on this combined classification would be inaccurate because of the substantial difference in carbon storage per acre between mature and structurally complex forests (see *Chapter 3 – Carbon Storage*). The environmental impact

**Figure 4-23.** Carbon Storage In Harvested Wood From Past And Future Harvests



statement assumes that all other lands would maintain their current abundances and spatial patterns, as explained previously in *Forest Structure and Spatial Pattern*. Therefore, the carbon storage associated with forests on these other lands would remain at current levels. However, there is no information to base a calculation of the carbon storage in wood harvested from these other lands. Timber harvest on other ownerships has fluctuated substantially over time (see *Chapter 3 – Socioeconomics*), and predicting future timber harvest levels from these lands would be speculative.

There may be complicated, synergistic effects of climate change on the rate of carbon release from forests. For example, increased atmospheric carbon dioxide levels might increase tree growth rates, increasing the rate of carbon storage in forests (Field et al. 2007, Harmon 2006, Bachelet and Neilson 2000). However, increased temperatures would increase plant respiration, possibly offsetting increases in tree growth (Harmon 2006). Increased regional temperatures might increase wildfire frequency and intensity, which could escalate the release of carbon stored in forests (Field et al. 2007, Westerling et al. 2006). There is inadequate information to quantify these potential synergistic effects on carbon storage, because the nature of these effects remains speculative.

This analysis is based on the best available information and is consistent with current theoretical approaches. However, as detailed above, incomplete and unavailable information requires the use of broad generalizations and assumptions, leading to substantial uncertainty in estimating carbon storage. Therefore, these results must be interpreted with caution, because the differences among the alternatives over time would be less than the uncertainty associated with these estimations.

As noted in *Chapter 3*, carbon storage in forests can affect atmospheric concentrations of carbon dioxide, and thereby affect global climate. The effects of changes in carbon storage on atmospheric carbon dioxide concentration are manifested globally. Therefore, the changes in carbon storage in the planning area must be placed in the context of global carbon storage and atmospheric carbon dioxide levels. Under all alternatives over time, forests and harvested wood in the planning area would continue to constitute 0.02% of current global carbon storage in vegetation, soil, and detritus. The annual increase in carbon storage under all alternatives would continue to offset less than 0.0001% of the current annual increase in atmospheric carbon dioxide. In that context, it is not possible to discern any effect of the alternatives on global climate, because both the difference between current carbon storage and carbon storage in 100 years under all alternatives, and the difference in carbon storage in 100 years among the alternatives is too small a portion of global carbon storage to detect any change in global carbon storage. No climate models have sufficient precision to reflect the effects on climate from such a small fractional change in global carbon storage.

# Socioeconomics

This analysis examines the county-level economic impacts in terms of employment and income associated with the BLM's timber harvests, BLM's payments to counties, BLM's budget requirements, and the economic value of the BLM timber program that would result from the alternatives.

***Key Points***

- None of the alternatives would produce timber receipts sufficient to bring county payments to the level provided by the Secure Rural Schools payments of the Secure Rural Schools and Community Self-Determination Act of 2000. Alternative 2 would produce the highest payments to the counties at 94% of the O&C portion of the 2005 Secure Rural Schools payment. The No Action Alternative would produce the lowest payments at 37% of the O&C portion of the 2005 Secure Rural Schools payment.
- Alternative 2 would have the most favorable impact on local economies and result in a net increase of 3,442 jobs and $136.5 million of wages. The PRMP would result in a net gain of 1,187 jobs and $52.1 million in associated income. The No Action Alternative would have the least favorable impact on local economies and result in a net decrease of 3,768 jobs and $125.5 million of wages.
- Economic activity created by the No Action Alternative would not offset jobs lost due to the loss of the Secure Rural Schools funding.
- Economic impacts would vary by county depending on:
  - economic structure of the economy
  - geographic distribution of the BLM timber sale program
  - a county's share of the Secure Rural School payments
  - projected changes in the wood products industry
- The BLM would require a budget increase to implement any of the five alternatives. The increase would range from 17% under the No Action Alternative, to 60% under Alternative 2.
- The present net value of the BLM timber harvest would range from $46.1 million under Alternative 3, to $962.3 million under Alternative 2.

## Introduction

Management of the BLM timber lands contributes to the economic activity in the western Oregon communities within the planning area. Timber harvesting and the manufacture of wood products create jobs and income in these sectors and also stimulate economic activity in other sectors of the local and regional economies. The BLM employees and BLM management expenditures also contribute to local economies. Approximately 50% of revenues received from the O&C lands, furthermore, flows directly to county governments and funds a variety of social services and investments.

The BLM-administered lands contribute to employment and income in industries other than those related to lumber and wood products. Dispersed and developed recreation, commercial fishing, hunting, special forest products, mining, and grazing all contribute to the region's economies. The BLM's receipts from these activities in western Oregon are relatively minor compared to the timber program. Annual receipts from recreation are $1.2 million; from special forest products are $300,000; and from grazing are $30,000 to $40,000. Except for leasable minerals, non-timber resources and programs are not based on what the market will pay for these goods, opportunities, or services, but are intended to augment appropriated funds to support administration of the programs.

Recreation on BLM-administered lands in western Oregon provides economic benefits to the planning area. However, detailed information regarding the economics of recreation is not provided here because none of the alternatives would have a material effect on recreation. A lower level of timber harvest in an alternative would not necessarily result in an increase in the level or value of recreation activities. The conclusion of this EIS in this respect is consistent with conclusions of the Northwest Forest Plan FSEIS and subsequent monitoring of that plan. In 1994, the Northwest Forest Plan reduced the harvest of timber on Forest Service and BLM-administered lands by approximately 80% of previous levels. However, recreation activity on these lands remained approximately the same after 10 years under the plan (Northwest Forest Plan: The First Ten Years, 2004).

This analysis does not include the economic effect of non-timber programs discussed above in the comparison of the alternatives, because the programs materially affected by any of the alternatives and the programs do not materially vary among the alternatives. Therefore, the overall economic and social effects and comparison of the alternatives would not be changed.

This analysis does not include the economic effect of non-market values such as wildlife, water quality, or the aesthetic value of forests. The analysis does not attempt to attach monetary values to such non-market values because to do so would be speculative and arbitrary. The NEPA regulations provide: "For purposes of complying with the Act (NEPA), 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 where there are important qualitative considerations (40 CFR 1502.23)."

The measures used for comparison of the alternatives are:

- **employment** - full-time equivalent jobs
- **income** - return to proprietors and wages associated with employment
- **payments to counties** - the O&C counties' share of the revenues that are paid to the BLM
- **BLM budget** - money spent for the BLM's personnel, services, equipment, etc.
- **present net value** - sum of discounted revenues and costs associated with the timber sale program

The volumes and revenues of harvests for this analysis were derived from the OPTIONS model. The Western Oregon Model (Adams and Latta 2007:8-14) was used to project delivery points for the projected harvest from OPTIONS. Developed at Oregon State University, this model relies on data about processing facilities, market prices, and private inventory to project log flows and production across western Oregon. County-level input/output models were constructed specifically for this analysis. Data specific to the economy of each county were incorporated into the model, resulting in employment and income projections tuned to the economy found in each county economy. The U.S. Forest Service's Timber Assessment Market Model was used to estimate the stumpage price impact of adding more BLM timber to the market. Revenues, employment, and income reported herein are based on the total harvest volumes, including both the harvest land base (lands that contribute to the annual sale quantity) and non-harvest land base. See *Appendix D - Socioeconomics* for a more complete discussion of the analytical process and the assumptions for this analysis.

An increase in the BLM timber harvest would lead to an increase in the total timber harvest in the market area and increased activity in the wood-processing sectors. Under all alternatives, as the BLM sells more timber into the log market, log prices would fall an estimated 3.5%, and timber harvests from price-sensitive private lands would fall slightly. Because of this price effect, the increase in the total harvest would be somewhat less than the increment of the BLM's timber. As manufacturing capacity adjusts to absorb the increased volume of the BLM's timber, prices and harvests from other owners would adjust to previous levels. See *Chapter 3* for discussion of the timber market and wood products industry.

Differences in the economic effect of the harvests between the alternatives are due not only to the differences in the volume of timber that would be harvested, but also to differences in the location and characteristics

of the timber that would be harvested. During the first 10-year period after implementation, for example, the harvest volume from Alternative 3 would be mostly from partial harvesting, whereas more regeneration harvesting would occur under the No Action Alternative, Alternatives 1 and 2, and the PRMP. Since thinning and partial harvesting cost more than regeneration harvesting, the average net revenue per thousand board feet would be highest under Alternative 2 and lowest under Alternative 3. The differences in the type of timber harvested would result in a difference in log quality. Large, peeler-grade logs, for example, would constitute more of the harvest volume under Alternative 2 than under the No Action Alternative. See *Table 4-7 (Distribution of harvest by harvesting type and the percentage of large, peeler-grade logs for the first decade)*.

As a result of the differences in the type of harvesting (thinning, partial harvesting, regeneration harvesting, and uneven-aged management) and log quality, there is a difference in the projected average stumpage prices between the alternatives. See *Table 4-8 (Estimated annual payments to the counties for the first decade)*; also see *Figure 4-49 (Annual stumpage value by alternative over the first decade)*, which is in the *Timber* section of this chapter. This table and figure show that stumpage prices within the first 10 years would range from $280 per mbf under Alternative 2, to $218 per mbf under Alternative 3.

Decadal average stumpage price projections are used throughout this analysis. All impacts related to timber revenues, therefore, are based on decadal average revenue projections. Actual stumpage prices would fluctuate from year to year, primarily in response to changes in national and international markets for end products. These short-term fluctuations would affect all alternatives equally, but not the comparison between alternatives.

Differences in the type and quality of logs harvested could also lead to differences in employment projections. For example, larger and higher-quality logs can produce higher-valued specialty products that often require more labor-intensive milling procedures. Large logs, on the other hand, generally require less logging labor. Although there is a clear relationship in value and stumpage price to log size and quality, there is no clear established relationship between log size and quality to employment levels.

# Payments to the Counties

Currently, the BLM-related revenues provide about 2.5% of the total revenue received by the O&C counties and 9.8% of the discretionary portion of the county budgets (see *Chapter 3*). These figures range from 0.1% of the total funding and 0.2% of the discretionary funding for the large metropolitan counties, to 20.5% of the total funding and 70.4% of the discretionary funding for the more rural southwestern Oregon counties. See the *Socioeconomic* section of *Chapter 3*.

Secure Rural Schools funding has expired and although there are proposals for a possible short-term renewal of some version of Secure Rural Schools funding, there are no proposals for a permanent or long-term extension. Therefore, this analysis assumes that the BLM payments to the counties would be based

**Table 4-7.** Distribution of Harvest By Harvesting Type And Percentage Of Large Peeler-Grade Logs For The First Decade

| Alternative | Total Annual Harvest (mmbf) | Regeneration Harvest (%) | Thinning (%) | Uneven-age Harvest (%) | Partial Cutting (%) | Peeler- size Logs (%) |
|---|---|---|---|---|---|---|
| No Action | 355 | 65 | 34 | 1 | 0 | 4.1 |
| Alternative 1 | 537 | 77 | 23 | 0 | 0 | 7.7 |
| Alternative 2 | 767 | 89 | 11 | 0 | 0 | 8.5 |
| Alternative 3 | 473 | 4 | 34 | 0 | 62 | 7.7 |
| PRMP | 591 | 60 | 40 | 0 | 0 | 4.0 |

on the pre-existing formula with which the counties would receive 50% of the BLM stumpage receipts and some minor additional funding, as described in *Chapter 3*.

*Table 4-8 (Estimated annual payments to the counties for the first decade)* shows that Alternative 2 would have the most timber and generate the highest payments to counties ($108 million). That is equivalent to 94% of the 2005 Secure Rural Schools (SRS) funding associated with BLM-administered lands and 46% of the SRS funding from all federal lands. The PRMP would generate payments to counties of $75 million, which is equivalent to 65% of the 2005 Secure Rural Schools (SRS) funding associated with BLM-administered lands and 32% of the SRS funding from all federal lands. The No Action Alternative would have the lowest total annual revenue ($83.9 million) and the lowest payment to counties ($42 million). That is equivalent to 37% of the 2005 Secure Rural Schools funding associated with the BLM-administered lands and 18% of the Secure Rural Schools funding from all federal lands.

*Table 4-9 (Comparison of 2005 Secure Rural Public School payments to annual payments to individual counties under the alternatives)* shows the payments to the counties for the first 10 years. The bulk of the projected payments is based on 50% of the BLM stumpage receipts. Actual stumpage receipts may vary from year to year, as explained above. The BLM stumpage revenue is distributed between the counties based on historic valuation. The distribution of other revenues is fixed at the 2005 level and does not change between alternatives. Since this is a minor amount of revenue, the distribution of the total revenue between the counties on a percentage basis would be nearly identical under any alternative.

*Table 4-9* also shows that the Secure Rural Schools funding associated with BLM-administered lands accounted for slightly less than half of the total Secure Rural Schools funding, and that the Secure Rural Schools funding associated with the U.S. Forest Service lands accounted for the other half. The distribution of USFS-related Secure Rural Schools funding differs from the distribution of the BLM-related Secure Rural School funding. The analysis of impacts on jobs and income is based on the assumption that the Secure Rural Schools funding would not be reauthorized. The U.S. Forest Service payments to counties (25% of timber sale revenue) averaged $4.2 million/year over the base period of 2000-2004. These results assume that National Forest timber harvests will not change significantly. Projecting a similar amount of payment into the future, however, would not make any substantive difference in projecting the effects of the BLM alternatives nor change the relative ranking of the alternatives.

*Figure 4-24 (Historic and projected BLM payments to the counties for the first decade)* compares the projected BLM payments to counties to the historic BLM payments. The No Action Alternative and Alternative 3 would provide average annual payments less than the lowest year in the 20-year history. Alternative 1 would provide average annual payments in the range seen during the late 1990s. Alternative 2 would provide average annual payments in the range seen in the late 1980s and again after the passage of the Secure Rural Schools (SRS) legislation, which started in fiscal year 2001. The PRMP would provide average annual payments to counties similar to those received in the 1990s, prior to the SRS legislation.

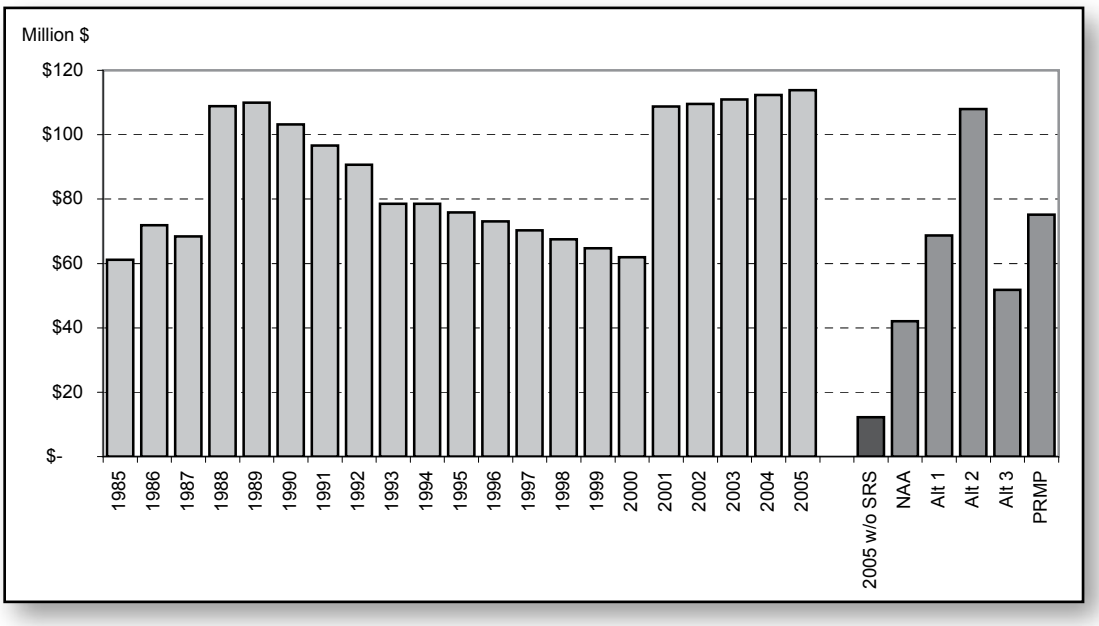
**Table 4-8.** Estimated Annual Payments To The Counties For The First Decade

| | Alternative | | | | |
|---|---|---|---|---|---|
| | **No Action** | **Alt. 1** | **Alt. 2** | **Alt. 3** | **PRMP** |
| Harvest of Short Logs (mmbf) | 355 | 537 | 767 | 473 | 591 |
| Adjusted Stumpage ($/mbf) | 234 | 254 | 280 | 218 | 254 |
| Total Revenue | 83.9 | 137.2 | 205.8 | 103.3 | 150.1 |
| O&C County Share | 42.0 | 68.7 | 108.0 | 51.7 | 75.1 |
| % of 2005 BLM payments | 37% | 60% | 94% | 45% | 65% |
| % of 2005 BLM, USFS, and Secure Rural School Payments | 18% | 29% | 46% | 22% | 32% |

**Table 4-9.** Comparison Of 2005 Secure Rural School Payments To Annual Payments To Individual Counties Under The Alternatives

| Counties | Secure Rural School Payments | | | Alternatives ($ million) | | | | |
|---|---|---|---|---|---|---|---|---|
| | BLM | USFS | Totals | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Benton | 3.2 | 0.5 | 3.7 | 1.2 | 1.9 | 3.0 | 1.5 | 2.1 |
| Clackamas | 6.3 | 7.2 | 13.5 | 2.3 | 3.8 | 6.0 | 2.9 | 4.2 |
| Columbia | 2.3 | 0.0 | 2.3 | 0.9 | 1.4 | 2.2 | 1.1 | 1.5 |
| Coos | 7.6 | 0.8 | 8.4 | 2.5 | 4.1 | 6.4 | 3.0 | 4.4 |
| Curry | 4.2 | 5.6 | 9.8 | 1.5 | 2.5 | 3.9 | 1.9 | 2.7 |
| Douglas | 28.7 | 22.7 | 51.4 | 10.5 | 17.2 | 27.0 | 12.9 | 18.8 |
| Jackson | 17.8 | 6.4 | 24.2 | 6.6 | 10.8 | 16.9 | 8.1 | 11.8 |
| Josephine | 13.8 | 3.1 | 16.9 | 5.1 | 8.3 | 13.0 | 6.2 | 9.1 |
| Klamath | 2.7 | 17.2 | 19.9 | 1.0 | 1.6 | 2.6 | 1.3 | 1.8 |
| Lane | 17.4 | 34.2 | 51.6 | 6.4 | 10.5 | 16.5 | 7.9 | 11.5 |
| Lincoln | 0.4 | 5.3 | 5.7 | 0.2 | 0.2 | 0.4 | 0.2 | 0.3 |
| Linn | 3.0 | 11.4 | 14.4 | 1.1 | 1.8 | 2.8 | 1.4 | 2.0 |
| Marion | 1.7 | 4.3 | 6.0 | 0.6 | 1.0 | 1.6 | 0.8 | 1.1 |
| Multnomah | 1.2 | 1.1 | 2.3 | 0.5 | 0.7 | 1.2 | 0.6 | 0.8 |
| Polk | 2.5 | 0.0 | 2.5 | 0.9 | 1.5 | 2.3 | 1.1 | 1.6 |
| Tillamook | 0.6 | 2.8 | 3.4 | 0.2 | 0.4 | 0.6 | 0.3 | 0.4 |
| Washington | 0.7 | 0.0 | 0.7 | 0.3 | 0.4 | 0.7 | 0.3 | 0.5 |
| Yamhill | 0.8 | 0.8 | 1.6 | 0.3 | 0.5 | 0.8 | 0.4 | 0.5 |
| Totals | 114.9 | 123.4 | 238.3 | 42.1 | 68.6 | 107.9 | 51.9 | 74.1 |

**Figure 4-24.** Historic And Projected BLM Payments To The Counties For The First Decade



# Employment and Income

The economic impact estimates for all alternatives were calculated from county-level input/output models. These models were tailored and field-calibrated to specifically address the types of impacts that are expected from the potential changes in the BLM timber harvest levels.

The economic impacts include the combination of direct effects due to:

- changes in BLM land management and county payments
- indirect effects associated with inter-industry transactions
- induced effects from payroll spending

The total effects are described in terms of changes in employment and earnings. Changes that would result from the alternatives are compared to a 2005 estimated baseline (labeled *current* in the following tables). The term (current) describes the amount of each county's 2005 economy that could be attributed to the combination of the BLM management actions and the Secure Rural Schools payments associated with both the BLM and the USFS. This analysis considers six principal sources of direct economic impacts on the O&C counties, which are:

- loss of current Secure Rural Schools payments to counties
- changes to BLM timber harvest levels and associated changes in logging and log hauling
- changes in administrative and contracting expenditures by the BLM
- changes in sawmill operations in response to changes in timber harvest
- changes in the output of plywood mills in response to change in timber harvest
- changes in board and pulp mill operations as more chips and sawmill residuals come on the market

Each of these changes is considered at the county level. To forecast future economic impacts at the county level, the Western Oregon Model developed at Oregon State University was used to project where the BLM timber harvested under each alternative would be manufactured into products (Adams and Latta 2007, 8-14). *Table 4-10 (Sources of economic effects by alternative)* provides a regional summary of direct effects for each alternative.

Two of these effects are dominant sources of economic impacts to the county economies throughout western Oregon. The Western Oregon Model projects a continuing shift in panel markets away from plywood to less-

**Table 4-10.** Sources Of Economic Effects By Alternative

| Source of Economic Effect | Current Amount[a] | Change by Alternative | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Payments to the counties ($ million) | 237 | (195) | (168) | (129) | (185) | (162) |
| BLM timber harvest (16-foot log mmbf) | 117 | 238 | 420 | 650 | 356 | 578 |
| BLM expenditures ($ million) | 141 | 26 | 55 | 91 | 45 | 63 |
| Lumber production (mmbf)[b] | 6,084 | 454 | 720 | 1,060 | 656 | 632 |
| Plywood production (mmsf 3/8 inches)[c] | 2,838 | (441) | (428) | (395) | (433) | (234) |
| Board mill output ($ million) | 26 | 32 | 53 | 83 | 51 | 79 |
| Pulp mill output ($ million) | 18 | 38 | 67 | 104 | 60 | 71 |

[a]Current amount represents a 2005 estimated baseline.
[b]mmbf – million board feet
[c]mmsf - million square feet

expensive oriented strand board (OSB). This shift would occur despite increased BLM timber harvests under the alternatives. Plywood production would decline by about 15-17% under all the alternatives.

Variations in BLM harvest are not a causal factor in the decline of plywood production; rather, projected declines are due to national market factors. Plywood production declines would occur even under the alternatives that would substantially increase the BLM's timber harvest. The projected decline in plywood production would reduce industry output more than $400 million under all of the alternatives. In addition, approximately 1,500 to 2,000 plywood and veneer jobs, and additional job losses from a multiplier effect, would be lost as a result of that decline in plywood production.

Historically, counties shared in federal timber sales receipts. Western Oregon counties received 25% of U.S. Forest Service receipts, and O&C counties received 50% from the BLM timber sale receipts. Under the Northwest Forest Plan, federal timber sales declined substantially from historic levels (see *Figure 3-28* in *Chapter 3*). The Secure Rural Schools funding that had compensated for lost timber receipt-sharing ended in 2006. These annual county payments had ranged from $0.7 million in Washington County, to $51.5 million in Lane County. This analysis assumes that a long-term or permanent reauthorization of the Secure Rural Schools and Community Self-Determination Act, or new similar legislation, would not occur.

Western Oregon counties would lose between 626 and 2,840 local government jobs from the loss of Secure Rural School payments; multiplier effects would double the total job loss. Losses would be the largest in the timber-dependent counties that have large federal land acreages. For example, under the No Action Alternative, Douglas County would lose more than 700 jobs in local government due to changes in county payments.

All alternatives would have an off-setting effect to the loss of Secure Rural School payments. Increased timber harvests in the PRMP would generate additional jobs in forestry, wood products, and related industries in most counties (see *Table 4-11* through *Table 4-15* below). In some counties, the increased income under the PRMP would help compensate for the loss of Secure Rural School payments. Increased industrial output and payroll under the PRMP would generate additional tax revenue for local government and demand for additional services such as public schools. Additional revenues from a larger industrial base would offset some of the local government jobs losses caused by terminated Secure Rural School funding (see *Table 4-17* and *Table 4-18*).

The increase in the BLM harvests would range between 208% and 560% under the action alternatives. These increased harvests would create between 800 and 1,500 jobs in logging and trucking, and about 600 to 1,500 additional jobs in the wood products manufacturing sectors that are linked to logging.

Increased BLM harvests, plus the projected increased private harvests (estimated by the Western Oregon Model), would allow sawmills, board mills, and pulp mills to increase output. This increase would not be one-for-one, as some substitution of the additional BLM timber harvest for private timber harvest would occur.

*Figure 4-25* through *Figure 4-29* (*Changes in employment by sector by county by alternative*) show the sector level impacts by county for each alternative. *Tables 4-11 through 4-15* (*Changes in employment by county and sector*) show that employment losses in some sectors would be offset by gains in other sectors. More detailed information about these projections is shown in *Appendix D - Socioeconomics.*

The BLM's land management, coupled with Secure Rural Schools payments, has played a large role in many western Oregon counties (refer to *Sources of Economic Effects by Alternative)*. Together, in 2005, they accounted for 8,948 regional jobs and $319.4 million in earnings. See *Table 4-16 (Total economic impacts associated with BLM timber harvests by alternative)*. Under all alternatives, economic losses would be greatest in southwestern Oregon where the O&C lands are concentrated. In Jackson and Douglas counties, revenues associated with the BLM-administered lands currently account for more than 3,000 jobs. Timber

**Figure 4-25.** Percent Of Change In Employment By County And Sector – No Action Alternative

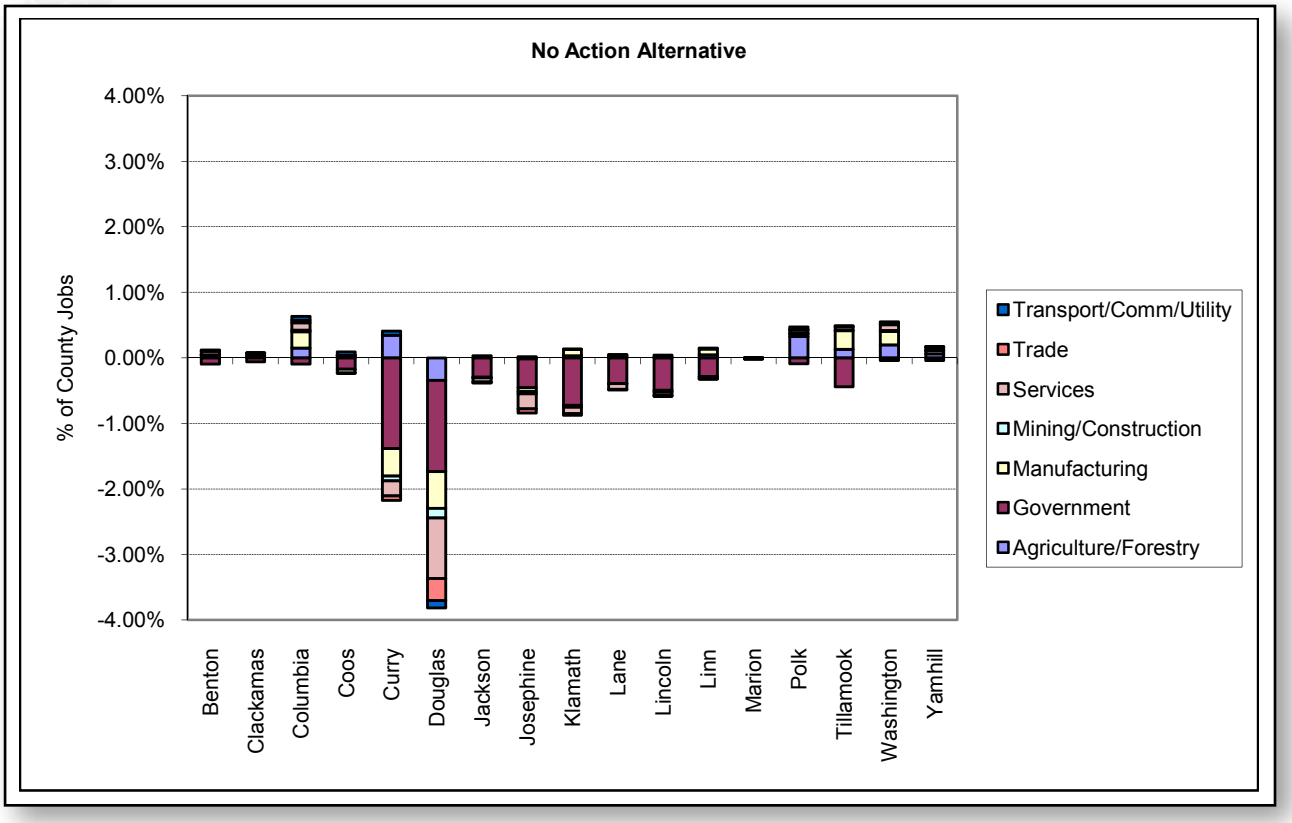



**Table 4-11.** Changes In Employment By County And Sector, No Action Alternative

| County | Agriculture and Forestry | Government | Manufacturing | Mining and Construction | Services | Trade | Transport, Communication, and Utility | Total |
|---|---|---|---|---|---|---|---|---|
| Benton | 19 | (35) | 0 | 1 | 19 | 4 | 4 | 12 |
| Clackamas | 74 | (108) | 69 | - | 9 | 4 | 3 | 51 |
| Columbia | 22 | (13) | 35 | 3 | 16 | 6 | 8 | 77 |
| Coos | 11 | (49) | (17) | 0 | 0 | 0 | 15 | (39) |
| Curry | 37 | (148) | (45) | (8) | (25) | (7) | 7 | (189) |
| Douglas | (179) | (736) | (297) | (76) | (489) | (176) | (60) | (2,012) |
| Jackson | 39 | (304) | (3) | (4) | (66) | (10) | (3) | (351) |
| Josephine | (4) | (164) | (22) | (14) | (84) | (25) | 8 | (306) |
| Klamath | 12 | (247) | 33 | (8) | (35) | (7) | 2 | (251) |
| Lane | 46 | (692) | 29 | (7) | (151) | (19) | 28 | (767) |
| Lincoln | 4 | (107) | 6 | (5) | (11) | (3) | 0 | (115) |
| Linn | 26 | (142) | 44 | (5) | (12) | (1) | 9 | (82) |
| Marion | 7 | (12) | 2 | (1) | (1) | 0 | 2 | (2) |
| Polk | 74 | (20) | 10 | 1 | 11 | 4 | 7 | 87 |
| Tillamook | 15 | (48) | 32 | 0 | 6 | 1 | 1 | 6 |
| Washington | 22 | (4) | 23 | 1 | 10 | 2 | 3 | 57 |
| Yamhill | 25 | (14) | 18 | 2 | 16 | 5 | 1 | 54 |
| **TOTAL** | **249** | **(2,840)** | **(83)** | **(119)** | **(787)** | **(223)** | **34** | **(3,768)** |

**Figure 4-26.** Percent Of Change In Employment By County And Sector – Alternative 1

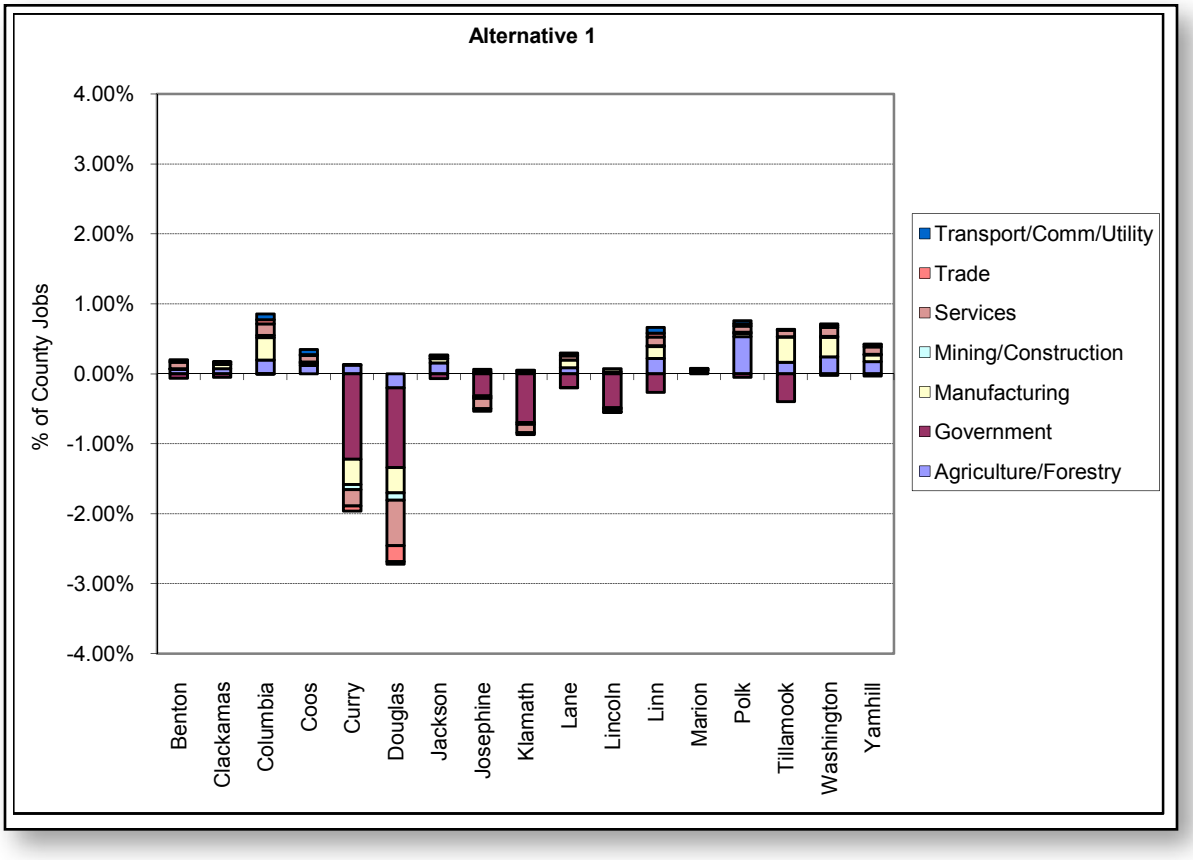



**Table 4-12.** Changes In Employment By County And Sector, Alternative 1

| County | Employment by Sector | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agriculture and Forestry | Government | Manufacturing | Mining and Construction | Services | Trade | Transport, Communication, and Utility | Total |
| Benton | 26 | (23) | 0 | 2 | 34 | 7 | 7 | 53 |
| Clackamas | 145 | (93) | 129 | 2 | 48 | 12 | 7 | 250 |
| Columbia | 28 | (1) | 45 | 5 | 23 | 8 | 12 | 120 |
| Coos | 34 | 8 | 6 | 0 | 27 | 4 | 21 | 100 |
| Curry | 13 | (131) | (39) | (8) | (25) | (8) | 1 | (196) |
| Douglas | (105) | (600) | (192) | (55) | (342) | (122) | (20) | (1,436) |
| Jackson | 161 | (71) | 67 | 0 | 32 | 7 | 14 | 211 |
| Josephine | 10 | (116) | (7) | (8) | (54) | (13) | 15 | (174) |
| Klamath | 9 | (238) | 8 | (9) | (41) | (9) | 1 | (278) |
| Lane | 155 | (354) | 200 | 0 | 102 | 18 | 64 | 184 |
| Lincoln | 6 | (104) | 10 | (4) | (8) | (2) | 0 | (102) |
| Linn | 113 | (132) | 84 | 7 | 63 | 27 | 43 | 205 |
| Marion | 14 | 65 | 5 | 4 | 26 | 4 | 6 | 124 |
| Polk | 120 | (11) | 11 | 3 | 20 | 7 | 10 | 160 |
| Tillamook | 18 | (43) | 40 | 0 | 10 | 1 | 1 | 27 |
| Washington | 27 | (2) | 31 | 2 | 14 | 3 | 2 | 76 |
| Yamhill | 66 | (11) | 38 | 3 | 39 | 13 | 3 | 151 |
| **TOTAL** | **840** | **(1,858)** | **435** | **(55)** | **(32)** | **(43)** | **188** | **(525)** |

**Figure 4-27.** Percent Of Change In Employment By County And Sector – Alternative 2

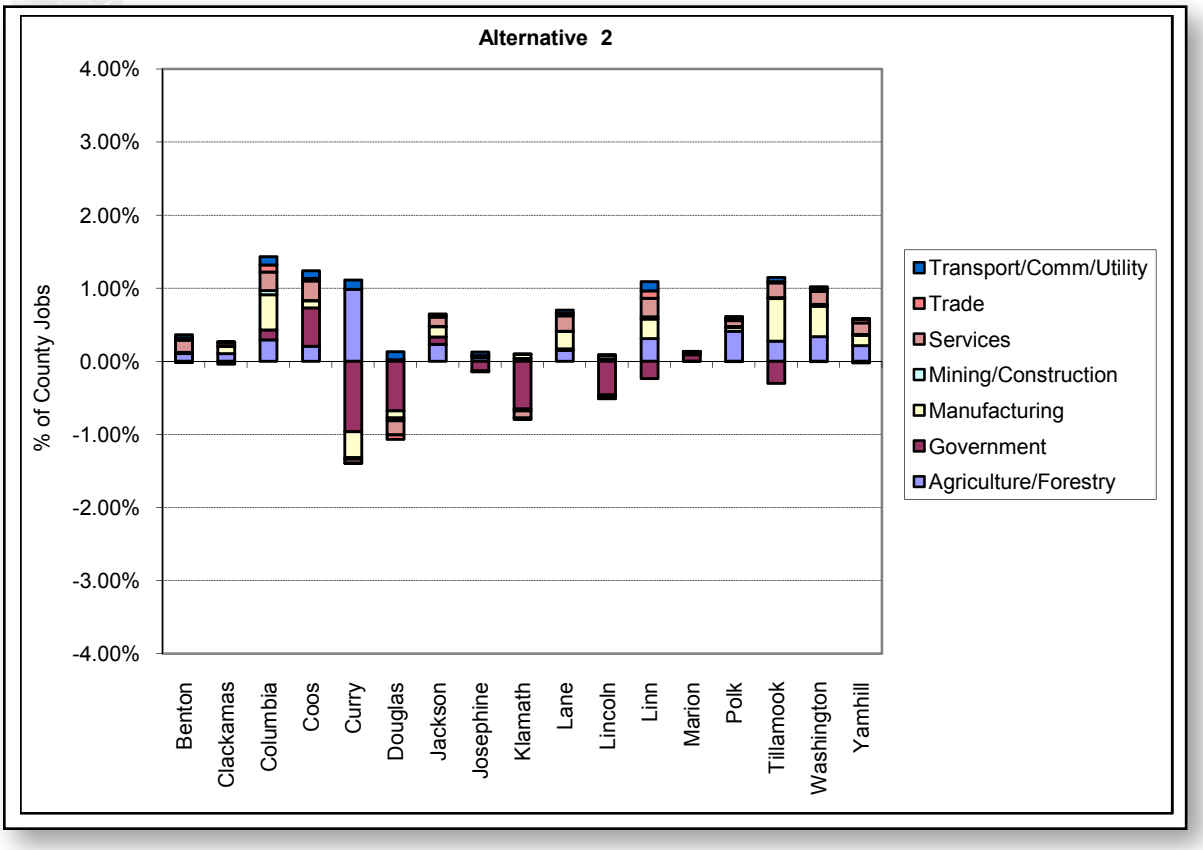



**Table 4-13.** Changes In Employment By County And Sector, Alternative 2

| County | Employment by Sector | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agriculture and Forestry | Government | Manufacturing | Mining and Construction | Services | Trade | Transport, Communication, and Utility | Total |
| Benton | 41 | (6) | 1 | 4 | 63 | 12 | 16 | 132 |
| Clackamas | 212 | (71) | 193 | 4 | 91 | 20 | 11 | 460 |
| Columbia | 42 | 19 | 68 | 8 | 36 | 14 | 16 | 204 |
| Coos | 60 | 151 | 27 | 2 | 77 | 10 | 30 | 358 |
| Curry | 106 | (103) | (38) | (2) | (6) | (1) | 14 | (30) |
| Douglas | 12 | (356) | (52) | (21) | (100) | (34) | 58 | (494) |
| Jackson | 244 | 102 | 147 | 4 | 130 | 24 | 21 | 672 |
| Josephine | 19 | (49) | 11 | (2) | (2) | 0 | 18 | (4) |
| Klamath | 14 | (223) | 19 | (8) | (34) | (7) | 2 | (237) |
| Lane | 271 | 36 | 423 | 7 | 380 | 59 | 85 | 1,261 |
| Lincoln | 8 | (99) | 11 | (3) | (7) | (1) | 0 | (91) |
| Linn | 158 | (120) | 135 | 17 | 128 | 51 | 63 | 432 |
| Marion | 11 | 134 | 6 | 9 | 49 | 6 | 4 | 219 |
| Polk | 93 | 0 | 12 | 3 | 18 | 6 | 7 | 139 |
| Tillamook | 31 | (33) | 64 | 1 | 22 | 2 | 6 | 93 |
| Washington | 37 | 0 | 46 | 3 | 19 | 4 | 3 | 112 |
| Yamhill | 82 | (7) | 53 | 5 | 60 | 19 | 5 | 216 |
| **TOTAL** | **1,440** | **(626)** | **1,127** | **31** | **924** | **186** | **360** | **3,442** |

**Figure 4-28.** Percent Of Change In Employment By County And Sector – Alternative 3

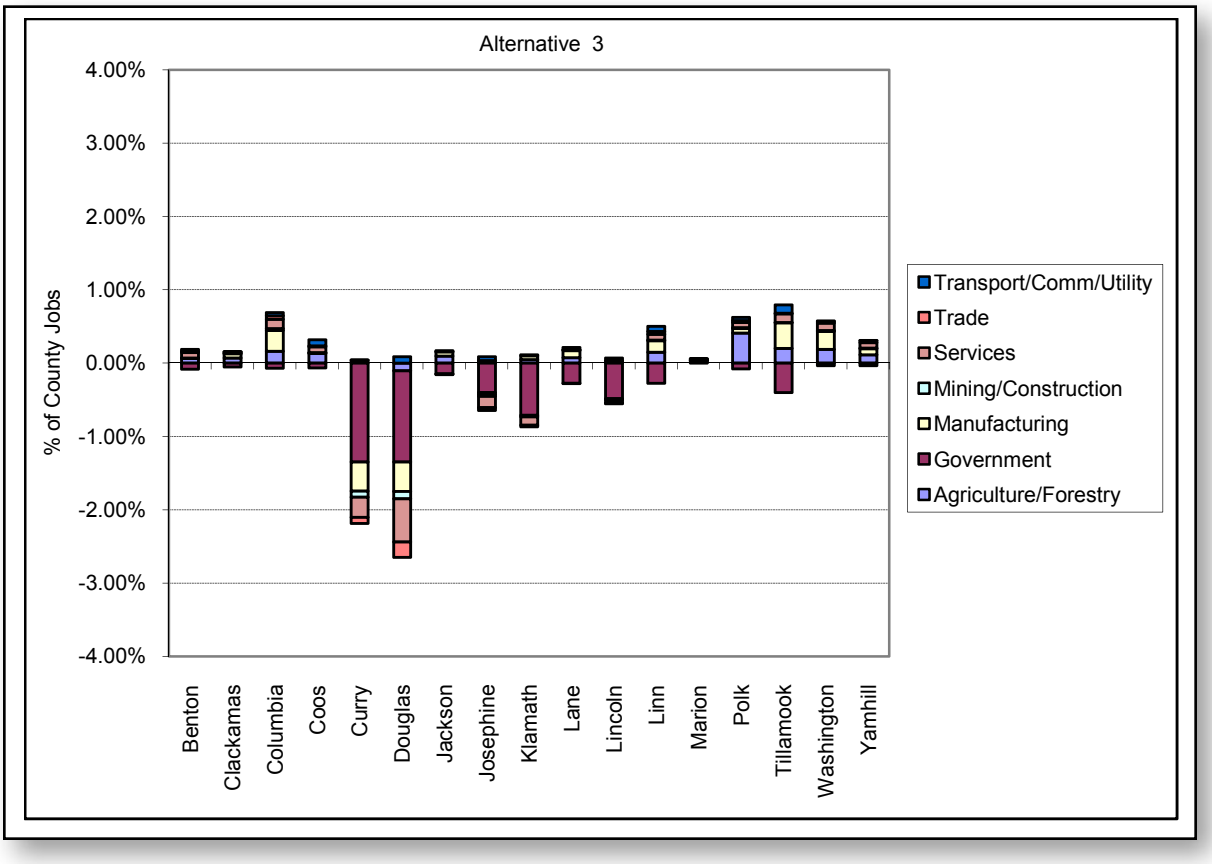



**Table 4-14.** Changes In Employment By County And Sector, Alternative 3

| County | Employment by Sector | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agriculture and Forestry | Government | Manufacturing | Mining and Construction | Services | Trade | Transport, Communication, and Utility | Total |
| Benton | 25 | (31) | 1 | 1 | 28 | 6 | 10 | 39 |
| Clackamas | 140 | (104) | 118 | 1 | 39 | 10 | 6 | 210 |
| Columbia | 23 | (10) | 40 | 4 | 18 | 7 | 6 | 88 |
| Coos | 38 | (18) | 3 | 0 | 23 | 4 | 25 | 75 |
| Curry | 4 | (144) | (43) | (9) | (29) | (9) | 1 | (230) |
| Douglas | (54) | (657) | (212) | (53) | (311) | (109) | 46 | (1,351) |
| Jackson | 102 | (153) | 62 | (1) | (7) | 1 | 13 | 16 |
| Josephine | 14 | (149) | (9) | (10) | (56) | (16) | 18 | (208) |
| Klamath | 16 | (242) | 19 | (9) | (38) | (7) | 3 | (257) |
| Lane | 136 | (489) | 172 | (3) | 14 | 6 | 52 | (111) |
| Lincoln | 7 | (104) | 8 | (4) | (8) | (2) | 0 | (103) |
| Linn | 76 | (139) | 80 | 3 | 41 | 19 | 37 | 117 |
| Marion | 13 | 47 | 3 | 3 | 21 | 3 | 6 | 95 |
| Polk | 93 | (17) | 13 | 2 | 16 | 6 | 10 | 123 |
| Tillamook | 22 | (44) | 38 | 1 | 13 | 1 | 12 | 43 |
| Washington | 21 | (4) | 27 | 1 | 11 | 2 | 1 | 60 |
| Yamhill | 44 | (13) | 31 | 3 | 29 | 10 | 3 | 106 |
| **TOTAL** | **721** | **(2,271)** | **351** | **(70)** | **(197)** | **(70)** | **248** | **(1,288)** |

**Figure 4-29.** Percent Of Change In Employment By County And Sector – PRMP

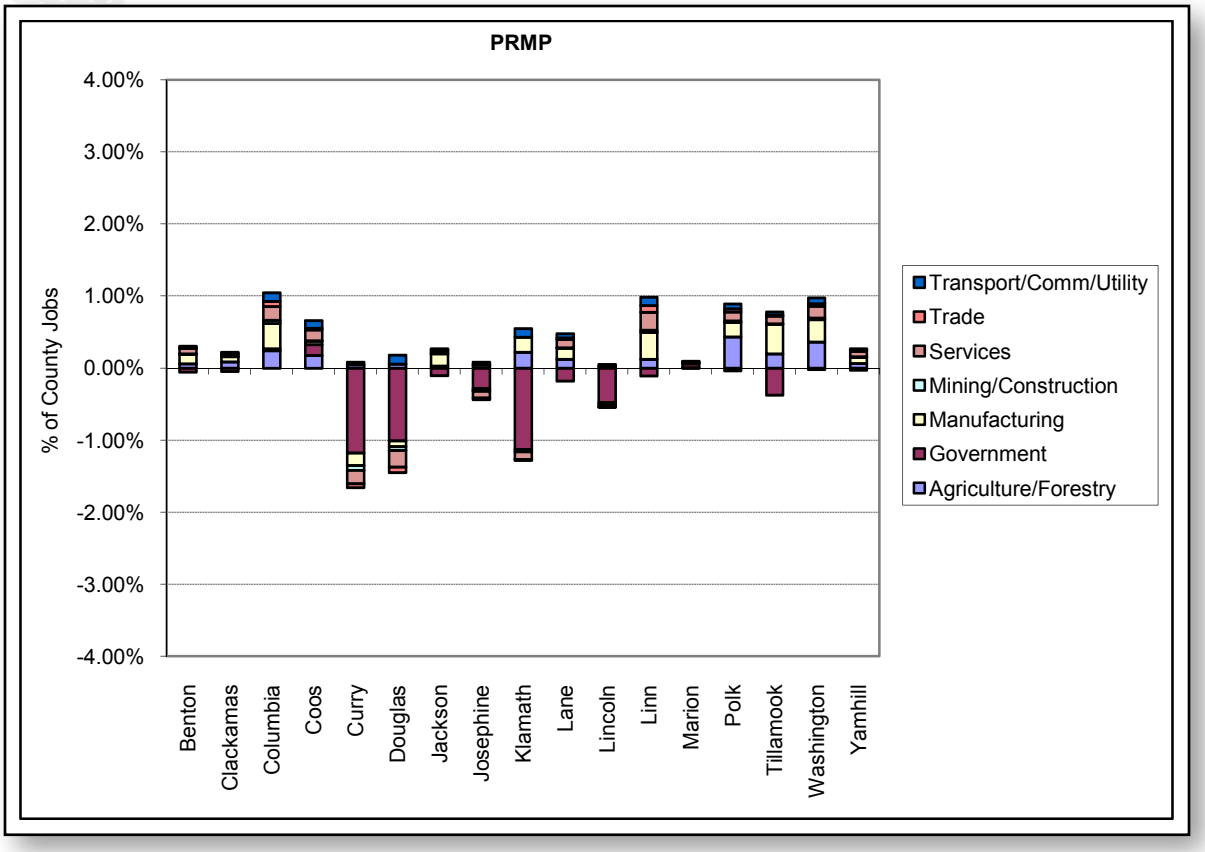



**Table 4-15.** Changes in Employment By County And Sector, PRMP

| County | Employment by Sector | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Agriculture and Forestry | Government | Manufacturing | Mining and Construction | Services | Trade | Transport, Communication, and Utility | Total |
| Benton | 22 | (21) | 50 | 2 | 29 | 6 | 7 | 94 |
| Clackamas | 174 | (89) | 148 | 3 | 69 | 16 | 23 | 344 |
| Columbia | 34 | 4 | 50 | 6 | 27 | 10 | 17 | 149 |
| Coos | 51 | 44 | 14 | 1 | 44 | 6 | 30 | 190 |
| Curry | 5 | (126) | (19) | (7) | (20) | (6) | 4 | (169) |
| Douglas | 30 | (533) | (43) | (27) | (122) | (39) | 66 | (669) |
| Jackson | 33 | (106) | 178 | 1 | 41 | 8 | 19 | 173 |
| Josephine | 15 | (104) | (9) | (7) | (34) | (9) | 16 | (132) |
| Klamath | 75 | (386) | 71 | (11) | (37) | (4) | 41 | (251) |
| Lane | 219 | (321) | 285 | 3 | 204 | 38 | 108 | 536 |
| Lincoln | 7 | (103) | 5 | (4) | (8) | 0 | (2) | (106) |
| Linn | 62 | (55) | 188 | 17 | 124 | 48 | 59 | 444 |
| Marion | 12 | 85 | 4 | 5 | 32 | 4 | 6 | 149 |
| Polk | 98 | (9) | 45 | 4 | 28 | 10 | 15 | 192 |
| Tillamook | 22 | (41) | 45 | 1 | 12 | 1 | 5 | 45 |
| Washington | 40 | (2) | 34 | 3 | 18 | 4 | 9 | 105 |
| Yamhill | 24 | (11) | 33 | 3 | 29 | 10 | 3 | 91 |
| **TOTAL** | **923** | **(1,774)** | **1,080** | **(6)** | **436** | **103** | **425** | **1,187** |

**Table 4-16.** Total Economic Impacts Associated With BLM Timber Harvests By Alternative

| Economic Impact | Current | Change in O&C County Totals by Alternative | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Employment (number of jobs) | 8,948 | (3,768) | (525) | **3,442** | (1,288) | **1,187** |
| Earnings ($ millions) | 319.4 | (125.5) | (7.3) | **136.5** | (34.7) | **52.1** |

harvested from the BLM-administered lands also plays important roles in the economies of Eugene-Springfield, Albany, Medford, Coos Bay, and Grants Pass.

Under all alternatives, timber harvesting would increase. There would be an increase in jobs and income along with a multiplier as impacts ripple through other sectors in the affected county economies. Economic effects would vary in proportion to increased timber harvest volumes. The economic effects would also vary with the amount of a county economy's concentration in the wood products sector. Economic activity in other sectors (caused indirectly by multipliers) would be based on the county's economic diversity and its self-sufficiency as a trade center. Under all alternatives except Alternative 2 and the PRMP, however, the loss of Secure Rural Schools funding coupled with the reduction in the plywood industry would be greater than the increased employment and earnings linked to increased BLM harvest levels. *Table 4-16,* therefore, shows that under the No Action Alternative and Alternatives 1 and 3, there would be a net reduction in jobs and income. For most counties, the higher harvest levels and higher stumpage prices for Alternative 2 and the PRMP would compensate for economic losses due to changes in the plywood sector and the loss of Secure Rural School funding.

The loss of Secure Rural Schools payments under the No Action Alternative would reduce regional earnings by about one-third. These reductions would be compounded by contraction in the plywood subsector of the wood products industry in Curry, Douglas, Jackson, Josephine, Linn, and Klamath counties.

Under the PRMP, there would be a net gain of 1,187 jobs in western Oregon with $52.1 million in associated income. All counties except Curry, Douglas Josephine, Klamath, and Lincoln counties would see net job increases. In these counties, increased timber harvests and sawmill operations would not be sufficient to offset losses of county payments and declining plywood production. Job losses in these counties would vary from negligible impacts in Marion County, to 2 percent of total employment in Douglas County. These losses would cause noticeable impacts in southern Oregon County economies, concentrated in sectors linked to local government and wood products industries.

Under the PRMP, the O&C timber harvests would shift geographically toward the Willamette Valley compared to the other alternatives. Because the harvest level would be proportionally higher in the northern districts compared to the other alternatives, there would be an accompanying increase in timber-related jobs and increased wood products manufacturing in these geographic area. See *Table 4-26 (Allowable sale quantity by district and alternative)* in the *Timbe*r section of this chapter.

Under Alternative 1, the increase of the BLM timber harvest would generate relatively small net economic impacts in western Oregon. Under Alternative 1, the jobs lost in some counties (Coos, Jackson, Lane, Linn, and Marion) would be offset by the jobs created in most other counties. However, Douglas and Klamath counties would have such large losses of jobs and earnings that there would still be a net loss overall in western Oregon.

Under Alternative 2, increased jobs and earnings would offset declines in most counties that would be caused by changes in the wood products industry and loss of Secure Rural Schools payments. Under Alternative 2, about 3,400 new jobs would be created and income would be increased by $137 million across western Oregon. Substantial increases would occur in Clackamas, Coos, Jackson, Lane, Linn, Marion, and Yamhill counties. However, the increase in the BLM's harvest under Alternative 2 would still not be sufficient

economic stimulus to overcome job losses in Curry, Douglas, Josephine, Klamath, and Lincoln counties. The job losses in these counties would be primarily in local government resulting mostly from losses of payments to the counties and contraction in the plywood sectors unrelated to the BLM's harvests.

For most counties, the economic impacts under Alternative 3 would be similar to those under Alternative 1. The exception would be Lane County, which would have considerably more jobs created in logging and wood products manufacturing. Under Alternative 3, there would be a net income loss of about $35 million across western Oregon. The most substantial county losses would occur in southwestern Oregon (Curry, Douglas, Josephine, and Klamath counties). For example, Douglas County would lose about $40 million in earnings. In the remaining counties, there would be enough economic increases resulting from the BLM's harvest to generally offset the loss of Secure Rural School payments. Nevertheless, many individual sectors, particularly those linked to plywood production, would still have income losses.

Only under Alternative 2 would there be sufficient economic gains from increased harvesting to offset the loss of Secure Rural Schools payments and the projected contractions in the plywood sub-sector. In some alternatives, particularly Alternative 2, the increased employment and income associated with the increased harvesting would be sufficiently large enough to offset the decreased employment and income caused by losses of Secure Rural Schools funding and the reduction in the plywood industry.

Jobs are an important indicator of the magnitude of the economic impact of the alternatives. A large set of O&C counties would generally show net gains under most of the alternatives. See *Table 4-17 (Counties in which the alternatives would compensate for other job losses)*. Note that under the No Action Alternative, however, harvest increases would be relatively small, so job losses resulting from other factors would not be offset in Coos, Jackson, and Linn counties.

Harvesting under any of the alternatives would not create sufficient jobs to compensate for job losses caused by the loss of Secure Rural Schools payments and the decline in plywood production in six counties. See *Table 4-18 (Counties in which the alternatives would not compensate for other job losses)*. The group of counties shown in *Table 4-18* is characterized by large losses in Secure Rural Schools payments and the presence of a large plywood subsector. Lane county would have mixed responses to the various alternatives due to more diversity in their forest products sector, but is included in this group due to large losses for the No Action Alternative and Alternative 3.

Douglas County would have the largest and most consistent economic loss among all the O&C counties, because it would lose large Secure Rural Schools payments ($51.1 million annually from the USFS and BLM) and because it has a large plywood subsector.

**Table 4-17.** Counties In Which The Alternatives Would Compensate For Other Job Losses

| Counties With Net Gains | Current Jobs | Changes in Employment by Alternative | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Benton | 118 | 12 | 53 | 132 | 39 | 94 |
| Clackamas | 265 | 51 | 250 | 460 | 210 | 344 |
| Columbia | 52 | 77 | 120 | 204 | 88 | 149 |
| Coos | 410 | **(39)** | 100 | 358 | 75 | 190 |
| Jackson | 1,612 | **(351)** | 211 | 672 | 16 | 173 |
| Linn | 396 | **(82)** | 205 | 432 | 117 | 444 |
| Marion | 272 | **(2)** | 124 | 219 | 95 | 149 |
| Polk | 54 | 87 | 160 | 139 | 123 | 192 |
| Tillamook | 79 | 6 | 27 | 93 | 43 | 45 |
| Washington | 22 | 57 | 76 | 112 | 60 | 105 |
| Yamhill | 59 | 54 | 151 | 216 | 106 | 91 |

**Table 4-18.** Counties In Which The Alternatives Would Not Compensate For Other Job Losses

| Counties With Net Losses | Current Jobs | Changes in Employment by Alternative | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Curry | 235 | (189) | (196) | (30) | (230) | (169) |
| Douglas | 2.204 | (2,012) | (1,436) | (494) | (1,351) | (669) |
| Josephine | 470 | (306) | (174) | (4) | (208) | (132) |
| Klamath | 571 | **(251)** | (278) | (237) | (257) | (251) |
| Lane | 1,987 | **(767)** | 184 | 1,261 | (111) | 536 |
| Lincoln | 143 | **(115)** | (102) | (91) | (103) | (106) |

A closer look at the estimated job impacts in Douglas County under the No Action Alternative illustrates the importance of considering all reasonably foreseeable sources of economic impact. If the economic analysis considered just the impacts of the changes to the harvest levels, the analysis would show that Douglas County employment would increase by 645 jobs simply as a result of increased harvest levels. If the analysis considered just the increased harvest levels and the contraction of the plywood industry, then the analysis would show a net loss of 936 jobs, because the plywood industry is heavily concentrated in Douglas County. If the analysis considered only the changes to the harvest levels and the loss of the Secure Rural Schools payments, then there would be a net increase of 163 jobs, which would result from an increase in the wood products sector offsetting losses in the government sector. When all three factors (the loss of the Secure Rural Schools payments, the contraction of the plywood industry, and the increase in BLM harvest levels) are considered together, there would be a net loss of 2,012 jobs. In other words, the increased employment in the wood products sector, specifically the sawmilling industry, would not be enough to offset losses in the government sector and the plywood industry. Similar relationships would occur in each county under each alternative, with the magnitude depending on the unique economic structure of each county and the specific harvest configuration of each alternative. Under the PRMP, there would be a 135 mmbf increase in Douglas County timber harvest, and jobs linked to this increase would compensate for some jobs lost in plywood production and county government.

There would be a spectrum of county economic responses to timber harvest increases under the alternatives. For the purpose of analysis and discussion, counties are clustered into five categories that reflect the sensitivity of individual county economies. A county may fall into one or more of these categories.

## Sensitivity Categories of County Economies

### Type 1

Type 1 county economies would have little or no impact from the alternatives. These counties have small Secure Rural School payments, few BLM lands, or little reliance on the wood products industries relative to the size of their economies. Benton County and Polk County are examples of this, although the geographical harvest shift under the PMRP would marginally increase Polk County's wood products employment. Clatsop County has so few connections to all of the impact sources that it was not modeled.

### Type 2

Type 2 counties have large diversified economies. In these counties, the economic effects of the alternatives would be small relative to the jobs and incomes generated by other sectors. Columbia and Washington counties have positive wood products sector responses, but they are primarily commuter adjuncts to Portland. Marion County is dominated by state and federal government sectors. The Portland metropolitan economy is so large that the Multnomah County model was not used.

## Type 3

These are counties in which the effects of the alternatives would be large enough to compensate for the loss of Secure Rural Schools payments—mostly from the higher levels of activity in the sawmill sectors and its multipliers. See *Table 4-19 (Wood products counties with gains concentrated in sawmills)*. These counties would face internal trade-offs between job and budget losses in county governments and labor gains as sawmills expand. Even though Coos and Curry counties would have sawmill sector gains, the Secure Rural Schools payment loss effect would remain concentrated in local government and sectors. In some cases, resource-based economies such as Lincoln and Tillamook counties are reliant on non-BLM timber sources, so they would be only peripherally affected by the BLM timber harvest changes under the alternatives. The plywood counties (see Type 5) are shown here to indicate that some may have sawmill gains even when plywood jobs are declining.

## Type 4

These counties have a large federal forest land base and significant wood products sectors. All counties had some reliance on federal Secure Rural Schools payments. The BLM harvest revenue sharing would offset losses somewhat under all alternatives. However, seven of these counties (Clackamas, Douglas, Jackson, Josephine, Klamath, Lane, and Linn) would be at large fiscal risk even considering higher BLM harvests. See *Table 4-20 (Counties losing more than $10 million per year in Secure Rural Schools payments)*. Job and budget losses would be concentrated in the county government sector and any multipliers tied to that sector.

Counties with large sawmill production value increases (e.g., Clackamas) and relatively small plywood subsectors would be most likely to have a neutral economic effect. Plywood counties have compounded economic losses from losses of payments to counties and adjustments in the wood products industry.

## Type 5

These are counties that would have substantial or moderate losses from all of the alternatives. Three plywood counties (Douglas, Jackson, Lane) would have substantial economic losses. Four other counties (Coos, Curry, Josephine, and Linn) would have moderate economic losses where the plywood industry supplements instead of characterizes the wood products sectors. Large projected reductions in plywood and veneer output values worsen the Secure Rural Schools payment losses. See *Table 4-21 (County plywood output contraction by alternative)*.

**Table 4-19.** Wood Products Counties With Gains Concentrated In Sawmills

| Counties With Concentrated Sawmill Gains | Current | Changes in Sawmill Sector Industrial Output ($1,000) by Alternative | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Clackamas | 4,913 | 14,717 | 27,702 | 40,412 | 25,541 | 27,526 |
| Columbia | 339 | 17,274 | 21,767 | 32,962 | 19,409 | 24,210 |
| Coos | 2,638 | 6,185 | 11,781 | 16,782 | 11,083 | 8,526 |
| Curry | 222 | 3,307 | 6,386 | 9,103 | 5,905 | 2,374 |
| Douglas | 12,892 | 18,895 | 36,493 | 56,132 | 34,257 | 26,262 |
| Jackson | 8,305 | 4,656 | 8,993 | 13,162 | 8,557 | 3,343 |
| Josephine | 1,569 | 1,741 | 3,363 | 4,793 | 3,109 | 1,250 |
| Lane | 15,711 | 30,573 | 58,205 | 91,352 | 55,606 | 54,922 |
| Linn | 2,392 | 13,197 | 16,790 | 23,936 | 14,881 | 14,571 |
| Polk | 462 | 9,160 | 11,905 | 16,588 | 10,504 | 10,114 |
| Tillamook | 726 | 11,854 | 14,926 | 23,471 | 14,311 | 16,412 |

**Table 4-20.** Counties Losing More Than $10 Million Per Year In Secure Rural Schools Payments

| Counties With Large Secure Rural Public School Funding Losses | Current ($ million) | Changes in Payments to Counties by Alternative ($ million) | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Clackamas | 13.5 | (11.2) | (9.7) | (7.5) | (10.8) | (9.3) |
| Douglas | 51.1 | (40.7) | (34.0) | (24.1) | (39.0) | (32.4) |
| Jackson | 24.3 | (17.7) | (13.5) | (7.4) | (16.7) | (12.5) |
| Josephine | 16.8 | (11.7) | (8.5) | (3.8) | (11.0) | (7.7) |
| Klamath | 19.9 | (18.9) | (18.3) | (17.3) | (18.7) | (18.1) |
| Lane | 51.5 | (45.1) | (41.1) | (35.1) | (44.2) | (40.1) |
| Linn | 14.4 | (13.3) | (12.6) | (11.6) | (13.1) | (12.4) |

**Table 4-21.** County Plywood Output Contraction By Alternative

| Counties With Plywood Output Contraction | Current Output | Changes in Plywood Output by Alternative ($ million) | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Coos | 78.5 | (12.2) | (12.1) | (12.2) | (12.2) | (14.9) |
| Curry | 42.9 | (6.6) | (5.9) | (5.9) | (6.6) | (7.4) |
| Douglas | 438.7 | (68.1) | (65.9) | (60.4) | (67.2) | (74.8) |
| Jackson | 271.4 | (42.0) | (39.8) | (37.3) | (39.7) | (22.9) |
| Josephine | 59.9 | (9.3) | (9.3) | (8.3) | (9.3) | (10.3) |
| Lane | 211.2 | (32.7) | (32.7) | (29.0) | (32.7) | (32.7) |
| Linn | 55.6 | (8.9) | (8.7) | (8.1) | (8.7) | (8.9) |

This pattern of economic response would be caused by large compounded economic losses from two sources: elimination of Secure Rural Schools payments concentrates economic impacts in county government employment, and budgets. The plywood contraction projection reduces highly paid jobs and high value-added production. The BLM harvests directly increase logging, transportation, sawmill, pulpmill, and board plant jobs only where these subsectors exist. As each of these sectors has different patterns of purchases from other sectors, many of these counties have unique multiplier effects.

A discussion of the overall economic impacts does not capture the subtleties of the impacts within the individual counties or the specific sectors, such as the plywood and sawmill industries. Under all alternatives, Douglas County would have the most severe economic losses. It would have a sharp decline in plywood production and local government, along with secondary effects in other such sectors as logging and the retail trade. Most of these economic losses would occur in the Roseburg vicinity, where government and plywood manufacturing are concentrated.

Economic losses in Curry County would not be as large as those in the larger Douglas County economy, but would still be substantial given the small size of the county. Increased logging and sawmill operations in Brookings would be offset by declines in plywood manufacturing. The loss of government jobs would be most severe in Gold Beach, the county seat. The loss of local governmental services would be particularly difficult for this county because of the high proportion of retirees who need such specialized services as home health care. Only 10 counties in the United States have higher retiree proportions than Curry County (Census 2000, 2006).

Klamath County would also experience substantial economic losses under all alternatives because of its large losses of Secure Rural Schools payment. Job losses in Klamath County under all alternatives would range from 237 to 278 jobs. Klamath County is a major plywood producer, so these job losses would be compounded by job losses resulting in adjustments in the wood products industry.

Josephine County and Jackson County have close economic ties and similarities. Both counties have plywood manufacturing operations that are projected to lose jobs; both counties have a large share of the O&C lands; and both county governments received large Secure Rural Schools payments. Grants Pass would experience economic losses due to the loss of county payments. Jackson County would experience an increase in jobs under the action alternatives including the PRMP. See *Table 4-17* (*Counties in which the alternatives would compensate for other job losses*). Cave Junction would experience improvements in its economy due to increased timber harvests from both the BLM and private forests. The Medford area is a major plywood manufacturing area and would experience large reductions in employment. Some of these economic losses would be offset by increased industry output in sawmills and board mills in White City. Local government services in both counties would shrink. The Medford economy is sufficiently diverse and robust that these job losses would be offset by growth in other economic sectors.

Lincoln County would experience economic losses under all alternatives. Almost all of these losses would be in local government, which would lose about 100 jobs. Newport would experience the most loss.

Lane and Linn County would experience similar economic losses, but Lane County's economic losses would be mostly the result of the loss of about $40 million in Secure Rural Schools payments. The logging and sawmill sectors in these counties would grow, particularly under the PRMP and Alternative 2, with both counties showing large economic gains in that part of the wood products sector, even though both counties would concurrently experience losses associated with the decline in plywood production. There would be a large economic loss to local government in these two counties, especially in both county seats (Eugene and Albany). These larger, more urban economies, however, are more resilient than the county seats in more rural areas. Plywood mill closures in communities such as Lebanon are more likely to produce long-term localized changes than those caused by changes in the BLM timber harvests.

The two other coastal counties (Coos and Tillamook) would experience improvements in their logging and sawmill sectors, particularly under Alternative 2 and the PRMP. In Coos County, these economic gains would be partially offset by losses in plywood manufacturing. Coos County has a much larger proportion of federal lands, so increased federal jobs would offset the reduction in local government funding and services resulting in little net government sector change. There would be a proportionally larger economic loss to Coquille compared to other communities because it has both a plywood plant and it is the county seat.

Counties in and near the Portland metropolitan area (Clackamas, Washington, Yamhill, and Columbia) are part of a diversified and rapidly growing economy. None of these counties have a large proportion of federal lands; none are timber dependent; and none are dependent on Secure Rural School funds, even though Clackamas would lose $11.3 million from this source. Economic impacts on these counties would be minimal and almost unrelated to the BLM's timber harvest changes. There are, however, some smaller communities within those counties that do have wood products-based economies. Willamina, Molalla, St. Helens, and Rainier would experience economic gain of varying degrees under all alternatives.

Central Willamette Valley counties (Benton, Marion, and Polk) would not experience a substantive economic effect as a result of any of the alternatives. They would have only lost $2.4 million to $4.6 million each from the termination of Secure Rural Schools payments. These counties are not major wood products processing counties and do not have significant shares of the O&C lands.

# Community Well-Being

Donoghue et al. (USDA USFS 2006c) calculated a socioeconomic well-being index for 433 communities in western Oregon and noted how the index changed between 1990 and 2000 (see the *Socioeconomics* section of *Chapter 3).* The results suggest those communities with low and or declining socioeconomic well-being scores are most typically found in the more rural and more southern counties.

The county-level analysis of jobs and income indicates that counties with the greatest potential net loss of jobs and income under any alternative are similarly more rural and more southern.

The analysis of the economic impacts of the alternatives describes net changes in county-level jobs and income. Because employees in one sector of an economy often require specialized skills and knowledge, employees may not be able to move easily from a declining sector to a growing sector. Although job creation in one sector does not offset all of the social costs of job losses in another sector, a more detailed analysis of these social effects is beyond the scope of this analysis.

# The BLM Budget

The BLM budget requirements would be higher under all alternatives, due to administrative costs of implementing higher timber harvest levels. For this analysis, budget requirements for nontimber resource programs and the state office, which were about 78% of the 2006 fiscal year budget, were held constant between alternatives. See Table *4-22 (BLM budget)* for budget requirements at full harvest levels under each alternative.

All alternatives would require an increase from the current BLM budget to implement increased levels of timber harvesting. Compared to the current level, the BLM budget would increase 18% under the No Action Alternative, 37% under Alternative 1, 62% under Alternative, 2, 31%, under Alternative 3, and 43% for the PRMP.

In addition to the costs shown on *Table 4-22*, expenditures for contractors to perform silvicultural treatments (planting, fertilization, pruning, etc.) would also increase. See *Table 4-23 (Annual expenditures for silviculture for the first 10 years by district*). These expenditures would vary by alternative based on the types of harvest anticipated under each alternative. Alternative 2 would require the highest expenditure, since it includes the most regeneration harvesting.

**Table 4-22.** BLM Budget

| BLM District | 2006 Fiscal Year | BLM Budget by Alternative ($ million) | | | | |
|---|---|---|---|---|---|---|
| | | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Salem | 16.1 | 21.3 | 30.7 | 38.9 | 28.5 | 32.7 |
| Eugene | 11.9 | 17.6 | 27.0 | 34.2 | 19.2 | 31.5 |
| Roseburg | 14.7 | 17.9 | 18.7 | 25.3 | 22.3 | 20.3 |
| Coos Bay | 12.8 | 18.2 | 20.5 | 30.4 | 19.1 | 21.9 |
| Medford | 33.9 | 39.6 | 46.3 | 50.8 | 44.2 | 45.6 |
| Klamath Falls Resource Area (Lakeview District) | 6.2 | 6.9 | 7.4 | 7.4 | 7.3 | 6.5 |
| BLM State Office (Portland) | 51.3 | 51.3 | 51.3 | 51.3 | 51.3 | 51.3 |
| **Totals** | 146.9 | 172.9 | 201.8 | 238.3 | 191.8 | 209.7 |

**Table 4-23.** Annual Expenditures For Silviculture For The First 10 Years By District And Alternative

| BLM District | Annual Expenditures for Silviculture For the First 10 Years ($ million) | | | | |
|---|---|---|---|---|---|
| | No Action | Alt. 1 | Alt. 2 | Alt. 3 | PRMP |
| Salem | 0.5 | 0.9 | 1.2 | 1.0 | 1.3 |
| Eugene | 0.8 | 1.2 | 1.6 | 1.1 | 1.5 |
| Roseburg | 1.5 | 1.6 | 2.3 | 2.8 | 1.4 |
| Coos Bay | 1.2 | 1.2 | 2.3 | 0.6 | 0.9 |
| Medford | 3.0 | 4.1 | 4.9 | 3.1 | 3.2 |
| Lakeview[a] | 0.1 | 0.3 | 0.3 | 0.1 | 0.1 |
| Totals | 7.2 | 9.3 | 12.7 | 8.6 | 8.2 |

[a]This represents the expenditures for the entire Lakeview District; only a part applies to the Klamath Falls Resource Area, which is the only portion of the Lakeview District that is within the planning area.

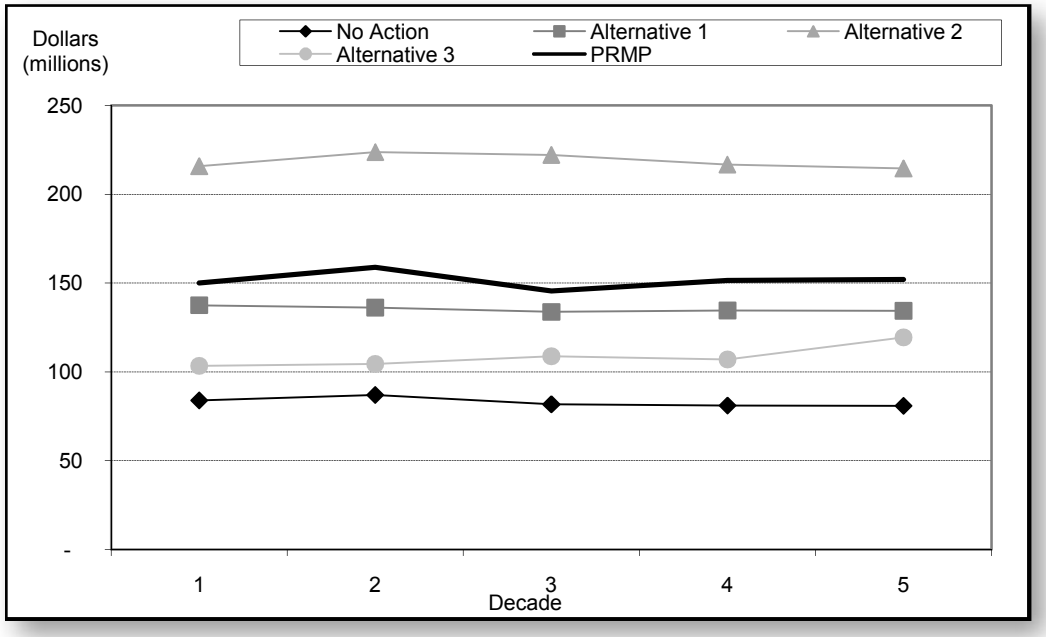
# Present Net Value of the Timber Program

Present net value is a measure of economic return. Future revenues and costs over a 50- year period are discounted back to the present using a 5% discount rate.

Projections of the stumpage revenue for each alternative reflect the amount of timber harvested, the type of harvest (regeneration harvesting, partial harvesting, or thinning), and the age or size of the timber that would be harvested. Stumpage revenues would change over time, reflecting changes in the nature of the sale program under each alternative. See *Figure 4-30 (Average annual stumpage revenues)*. These revenues include volume from both the harvest land base (from which the annual sale quantity is calculated) and volume from the nonharvest land base during the first five decades after implementation.

For the No Action Alternative, Alternatives 1 and 2, and the PRMP, for example, harvests past the first decade would have less thinning volume from the Late-Successional Reserves or Late-Successional

**Figure 4-30.** Average Annual Stumpage Revenues



Management Areas, which would reduce the total volume and value of timber harvests over time. Under Alternatives 1 and 2, higher-valued harvests from the structurally complex forests would decline after the first couple of decades; the harvests would shift to more mature and less structurally complex forest types, which would reduce the average harvest value. Under the PRMP, higher-valued harvests from the structurally complex forests would be deferred for the first 15 years. The harvest of structurally complex forests in the harvest land base would then take place from 2023 to 2106. Under Alternative 3, harvesting would shift from partial harvesting to regeneration harvesting with an accompanying reduction in costs, resulting in an increase in stumpage revenue.

Revenue projections are based on the 2005 average log price and do not include any future real price increase. Revenues under all alternatives are based on an assumption that stumpage prices in the market area would fall 3.5% during the first 10-year period as the BLM adds more timber into the market. By the second decade, it is assumed that mill capacity would adjust to absorb the additional capacity, and the market adjustment is removed. Timber prices respond to markets for final products and vary from year to year. This analysis assumes that changes to the BLM timber sale program would not materially affect end product prices and that all alternatives would, therefore, experience the same market fluctuations. Based on these assumptions, the comparisons between alternatives are valid regardless of market fluctuations.

Under all alternatives, the cost of the BLM timber program is estimated to be $200 per mbf. This includes all of the work associated with preparing, offering, and administering timber sales. It includes work done by members of a timber sale interdisciplinary team, National Environmental Policy Act compliance work, overhead, etc. The additional silvicultural costs specific to each alternative are also included in the calculation. See *Table 4-23 (Annual expenditures for silviculture for the first 10 years by district)* in the previous section (*BLM Budget*).

See *Figure 4-31 (Revenues, costs, and net revenues for the first 10 years)* for a comparison of the revenues, costs, and net revenues for the first 10 years. See *Table 4-24 (Revenues and costs for the first 10 years and the present net value over 50 years by alternative).*

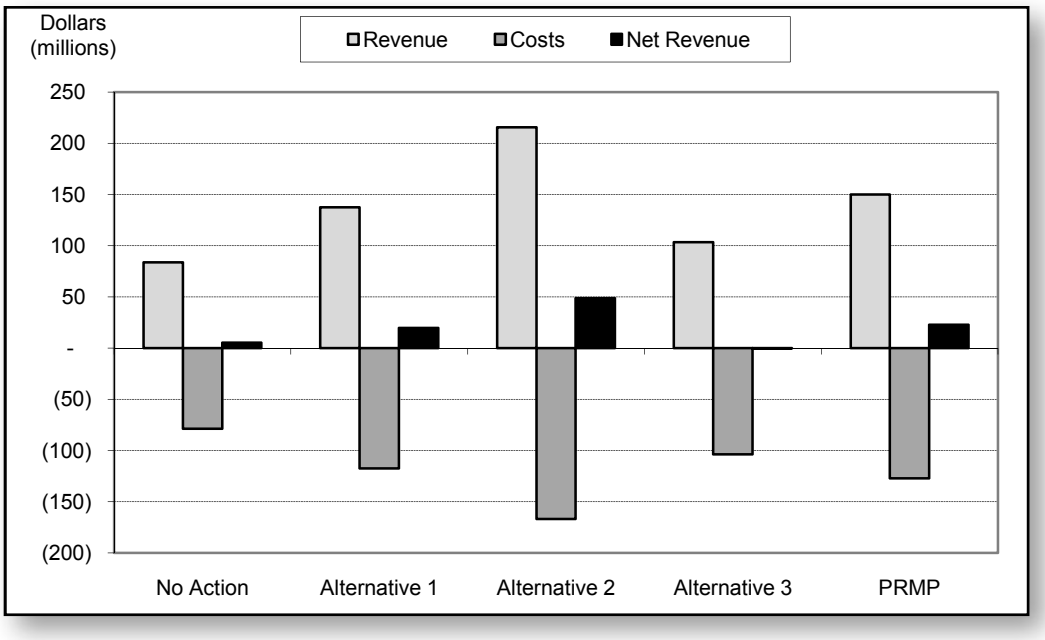
Alternative 2 would have the highest total revenue of all alternatives because it would have both the highest harvest level and the highest stumpage value. First decade revenues under the No Action Alternative would be the lowest of all alternatives. This is because even though the No Action Alternative would have an 8% higher average stumpage value than Alternative 3, it would have 33% less harvest volume.

The alternatives are ranked differently with respect to the 50-year present net value calculation. From the highest to lowest present net value, the alternatives would be ranked Alternative 2, the PRMP, Alternative 1, the No Action Alternative, and Alternative 3. Because the average first decadal stumpage price under Alternative 3 is close to the average timber program cost, the net revenue under Alternative 3 would be negative in the first 10 years. Net revenues in subsequent decades would be slightly positive as capacity adjusted to the additional BLM volume and stumpage prices rebounded.

**Table 4-24.** Revenues And Costs For The First 10 Years And The Present Net Value Over 50 Years By Alternative ($ million)

| Alternative | Decade 1 | | | Present Net Value Over 50 Years |
|---|---|---|---|---|
| | Total Revenues | Total Costs | Net Revenues | |
| No Action | 83.9 | (78.7) | 5.2 | 107.5 |
| Alternative 1 | 137.5 | (117.7) | 19.8 | 342.8 |
| Alternative 2 | 215.8 | (166.9) | 48.9 | 962.3 |
| Alternative 3 | 103.3 | (103.8) | (0.4) | 46.1 |
| PRMP | 150.1 | (127.1) | 23.0 | 465.0 |

**Figure 4-31.** Revenues, Costs, And Net Revenues For The First 10 Years




The present net value calculation shown here is based only on the costs and revenue of timber harvests. It does not include the value of the standing inventory, which would increase under all alternatives. (Growth would exceed harvest because of the amount of lands allocated to the nonharvest land base.) As discussed earlier in this Socioeconomics section, the present net value also does not include the cash revenues and costs associated with nontimber outputs, such as special forest products, nor any economic value associated with other commodity or amenity values.

# Environmental Justice

This analysis examines the disproportionate impacts on low-income and minority populations that would result from the alternatives.

***Key Points***

- No high or adverse human health or environmental effects have been identified for any of the alternatives.
- The effects of the alternatives are not expected to fall disproportionately on minority or low income populations.

Federal agencies are required to "identify and address…{the }*disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States*" in accordance with Executive Order 12898 regarding environmental justice.

The guidelines described by the Council on Environmental Quality (CEQ 1997) were used to guide the analysis of the potential environmental justice issues associated with the western Oregon resource management plan revisions. The analysis included:

- a determination of the geographic distribution of low-income populations and minority populations within the affected area (i.e., the planning area)
- an assessment of whether the impacts of the alternatives produce impacts that are high and adverse
- if impacts are high and adverse, a determination as to whether these impacts would disproportionately impact low-income populations or minority populations

The following Council on Environmental Quality guidelines (CEQ 1997) are used to identify minority and low-income populations:

- **Minority population**. A minority population is identified for a geographic unit if the number of minority persons (Hispanic/Latino, Black/African American, American Indian/ Alaskan Native, Asian, Native Hawaiian/Other Pacific Islander, or some other race ) is:
  - greater than 50% of the total population of that geographic unit, or
  - meaningfully greater than the percentage of the minority population in the reference unit for that geographic unit.

  For this analysis, each county is a geographic unit and the state of Oregon is the reference unit.

  The first part of the Council on Environmental Quality's guidance on minority population provides a numeric measure, which is that the number of minority persons must exceed 50% of the total population for an affected area (i.e., a geographic unit). The remainder of the guidance calls for a judgment in evaluating the potential for environmental justice concerns. It is important to consider the circumstances of any one group that resides within the affected area, in addition to considering the percentage of the affected community that is composed of minority persons (EPA 1998).
- **Low-income population**. Low-income individuals are defined as individuals who fall below the poverty line. The poverty line takes into account the size of the family and the age of individuals in the family. In 1999, for example, the poverty line for a family of five with three children below the age of 18 was $19,882. For any given family below the poverty line, all family members are considered as being below the poverty line for the purposes of analysis (Proctor and Dalaker 2002).

  Although there are no quantitative guidelines by the Council on Environmental Quality regarding the percentages of low-income populations in reference to larger populations, the Council on Environmental Quality suggests a screen to determine if low-income populations are unevenly distributed in an affected area compared to the larger population.

See *Table 4-25* (*Current composition of minority and low-income populations of the counties within the planning area compared to the state of Oregon*) for the current composition of the minority and low-income populations for each of the 18 counties within the planning area and the state of Oregon based on 2000 census data and the Council on Environmental Quality's guidelines. Counties that exceed the state-wide averages for minority or low-income populations are highlighted.

According to *Table 4-25*:

- *For minority populations*:
  - None of the minority populations in the counties exceeds 50% of the total population of the county.
  - Three counties exceed the state average for the percentage of minorities. The percentage of minority individuals in these three counties exceeds the state average by 6 to 7 percentage points.
  - These three counties are within large metropolitan areas with diverse economies (Portland and Salem). For these three counties, the BLM-administered lands constitute less than 3% of the county area.
- *For low-income populations*:
  - There are 12 counties that exceed the state average for the percentage of low-income populations. They exceed the state average by 0.1 to 5.4 percentage points.
  - One of the 12 counties (Klamath County) is more than 5 percentage points above the state average. Approximately 7% of the lands within Klamath County are BLM-administered lands. These BLM-administered lands are largely public domain lands east of the Cascade Mountains and are close to unincorporated populations. Low-income populations are not expected to be unevenly distributed in relationship to the BLM-administered lands.

No high or adverse human health or environmental effects have been identified for any of the alternatives, and effects are not expected to fall disproportionately on minority or low-income populations.

**Table 4-25.** Current Composition Of Minority *And* Low-Income Populations Of The Counties Within The Planning Area Compared To The State Of Oregon

| Counties Within the Planning Area | Total Population | White | Hispanic/ Latino | Black/ African American | American Indian/ Alaskan Native | Asian | Native Hawaiian/ Other Pacific Islander | Other Race | 2+ Races | Total Minority | Percent Minority | Total Low-Income | Percent Low-Income |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benton | 78,153 | 67,816 | 3,645 | 637 | 556 | 3,493 | 175 | 173 | 1,658 | 10,337 | 13.2 | 10,655 | 14.6 |
| Clackamas | 338,391 | 301,548 | 16,744 | 2,056 | 2,090 | 8,216 | 521 | 317 | 6,899 | 36,843 | 10.9 | 21,969 | 6.6 |
| Columbia | 43,560 | 40,576 | 1,093 | 97 | 540 | 246 | 39 | 43 | 926 | 2,984 | 6.9 | 3,910 | 9.1 |
| Coos | 62,779 | 56,616 | 2,133 | 169 | 1,412 | 553 | 99 | 66 | 1,731 | 6,163 | 9.8 | 9,257 | 15.0 |
| Curry | 21,137 | 19,206 | 761 | 31 | 408 | 144 | 21 | 29 | 537 | 1,931 | 9.1 | 2,554 | 12.2 |
| Douglas | 100,399 | 92,302 | 3,283 | 165 | 1,446 | 601 | 83 | 86 | 2,433 | 8,097 | 8.1 | 12,999 | 13.1 |
| Jackson | 181,269 | 160,795 | 12,126 | 674 | 1,782 | 1,583 | 291 | 198 | 3,820 | 20,474 | 11.3 | 22,269 | 12.5 |
| Josephine | 75,726 | 69,233 | 3,229 | 192 | 844 | 460 | 78 | 52 | 1,638 | 6,493 | 8.6 | 11,193 | 15.0 |
| Klamath | 63,775 | 53,659 | 4,961 | 362 | 2,443 | 482 | 72 | 96 | 1,700 | 10,116 | 15.9 | 10,515 | 16.8 |
| Lane | 322,959 | 286,075 | 14,874 | 2,391 | 3,268 | 6,390 | 562 | 534 | 8,865 | 36,884 | 11.4 | 45,423 | 14.4 |
| Lincoln | 44,479 | 39,260 | 2,119 | 113 | 1,296 | 412 | 66 | 31 | 1,182 | 5,219 | 11.7 | 6,084 | 13.9 |
| Linn | 103,069 | 94,012 | 4,514 | 285 | 1,192 | 789 | 125 | 92 | 2,060 | 9,057 | 8.8 | 11,618 | 11.4 |
| Marion | 284,834 | 217,880 | 48,714 | 2,274 | 3,326 | 4,905 | 967 | 337 | 6,431 | 66,954 | 23.5 | 37,104 | 13.5 |
| Multnomah | 660,486 | 505,492 | 49,607 | 35,592 | 5,754 | 37,344 | 2,206 | 1,216 | 22,275 | 154,994 | 23.5 | 81,711 | 12.7 |
| Polk | 62,380 | 53,394 | 5,480 | 229 | 1,078 | 671 | 152 | 57 | 1,319 | 8,986 | 14.4 | 6,943 | 11.5 |
| Tillamook | 24,262 | 22,086 | 1,244 | 42 | 273 | 154 | 50 | 9 | 404 | 2,176 | 9.0 | 2,718 | 11.2 |
| Washington | 445,342 | 346,251 | 49,735 | 4,778 | 2,335 | 29,552 | 1,249 | 650 | 10,792 | 99,091 | 22.3 | 32,575 | 7.4 |
| Yamhill | 84,992 | 71,684 | 9.017 | 592 | 1,134 | 889 | 91 | 76 | 1,509 | 13,308 | 15.7 | 7,336 | 9.2 |
| Oregon | 3,421,399 | 2,857,656 | 275,314 | 53,325 | 40,130 | 100,333 | 7,398 | 4,550 | 82,733 | 563,743 | 16.5 | 388,740 | 11.4 |

Source: U.S. Bureau of the Census (2000)