THE WILDERNESS SOCIETY

December 27, 2007

Mr. Edward Shepard
State Director
Bureau of Land Management
Oregon State Office
P.O. Box 2965
Portland, Oregon 97208

Dear Mr. Shepard:

I work as a resource economist for The Wilderness Society in Seattle, Washington and Bozeman, Montana. I earned a B.S. with a major in Economics from the University of Montana in 1981. I attended graduate school at the Economics Department of the University of Wyoming, where I earned a Ph.D. in Economics in 1986. Since, I have held tenure-track or tenured faculty positions at the Economics Departments of New Mexico State University and Oregon State University (OSU). At OSU I became Associate Professor of Economics in 1992 and Professor of Economics in 2002. I held the latter position until 2007. In 2003-2004, I served with the Environmental Protection Agency in Washington, DC as a Science and Technology Policy Fellow of the American Association for the Advancement of Science. I have published numerous papers on environmental and natural resource economics in peer-reviewed journals, such as the *American Economic Review*, *Journal of Environmental Economics and Management*, *Energy and Resource Economics*, *Rand Journal of Economics*, *American Journal of Agricultural Economics*, and *Ecological Economics*.

As you are aware BLM has proposed to revise the management plans for over 2.6 FImillion acres of BLM managed lands located in the Oregon Coast Range and the west

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Pacific Northwest Region

slopes of the Cascade Mountains. Pursuant to this in August 2007 BLM released Draft Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management Districts (DEIS I, II, and III) and invited comments. BLM's has selected Alternative #2 as its preferred alternative. Alternative #2 would nearly triple the volume of timber extracted from BLM lands, from the current 268 MMBF (million board feet) to 769 MMBF per year and would double the acreage of old-growth stands logged. In the first 10 years, BLM's Alternative #2 would subject 143,400 acres to clearcutting, euphemistically referred to as regeneration cuts. Alternative #2 would reduce the acreage of late-successional reserves established by the Northwest Forest Plan from 936,000 acres to 494,000 acres. Late successional reserves serve as vital refugia for over 600 species associated with old-growth forests in the Pacific Northwest (PNW).

Alternative #2 would also reduce the width of riparian buffers by about 75 percent, and reduce Riparian Reserves from 364,000 acres to 156,000 acres. Riparian buffers are vital to enhancing or maintaining aquatic microclimates important for salmon and other aquatic species.

In preparing its DEIS and selecting its preferred alternative, BLM has failed to use the appropriate tools to estimate the economic impacts of its actions and/or has failed to adequately explain how the analytic tools were applied. It addition, BLM has not considered the full range of scientific research on the ecological and economic value of PNW forests. My comments identify some of the errors in the economic analysis conducted in the DEIS and suggestions for improvement.

I will focus my comments in five areas:

I. The economic analysis done by BLM for DEIS is inadequate. It does not adequately consider changes in wood products and stumpage markets, technological change in lumber manufacturing, and a reasonable range of future economic scenarios.

II. The economic models used by BLM to make employment and revenue predictions are either not adequately explained and documented or inadequate for the task of forecasting timber volumes and revenues, O&C payments, and employment effects 10 years or more into the future.

III. BLM's socioeconomic analysis fails to consider the changing nature of the economies of Oregon, especially its rural economies, and the important role played by natural amenities and protected public land in these economies;

IV. BLM's socioeconomic analysis completely fails to consider the impact of its management decisions on the valuable ecosystems services provided by the PNW forests, including clean water, biodiversity, and climate-regulating carbon storage.

V. By choosing to manage its lands for additional timber extraction, BLM will not be able to achieve its goal of contributing to community stability.

Please give my comments and recommendations the appropriate consideration and make necessary supplements and changes to the DEIS.

Best Regards,

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I. Economic Analysis Conducted by BLM

BLM's economic analysis is inadequate. Specifically, it fails to adequately address the following areas:

Stumpage Prices

BLM projections of stumpage prices appear to be based on optimistic forecasts of the conditions in the wood products market. BLM reports (DEIS I, p. 234, Figure 36) average stumpage prices for BLM timber from 1989 to 2006. Since 1999, the average stumpage price received by BLM timber never exceeded $200/Mbf in current dollar terms. The Producer Price Index stood at 122.8 in December 1998 and at 165.1 in November 2006, while the average stumpage price received by BLM is about $200 in both years. Thus, the stumpage price for BLM timber has fallen over the period by about 35 percent in real terms.

Moreover it is highly likely that stumpage prices have fallen substantively since 2006. Although Oregon stumpage prices are not available to me for 2006-2007, Oregon Department of Forestry reports that delivered log prices, a close proxy for stumpage prices in Oregon, have fallen substantively since the first quarter 2005. Number 1 Douglas fir peeler prices have fallen from $1225/Mbf in first quarter 2005 to $595 in third quarter 2007, or 51 percent (Oregon Department of Forestry 2007). During the same period, the delivered log prices of Number 2 Douglas Fir and number 4 Douglas fir have fallen by 16 percent and 26 percent, respectively, while hemlock log prices have fallen by 5 to 10 percent. (Oregon Department of Forestry 2007). Of course, in real terms these price decreases have been somewhat steeper.

BLM uses conditions in 2005 as a benchmark for its economic analysis of timber revenues. DEIS II (p. 577) states, "The values shown in Figure 186…are calculated using 2005 log prices. Values are in 2005 dollars without adjustment for inflation." These log prices represents the peak of the Oregon lumber market, in terms of the prices of delivered logs over the last several years (Oregon Department of Forestry 2007). Given the projected continual recessed state of the real estate market over at least the next five years (Tully 2007), it is not likely that the high stumpage prices projected by BLM will be realized. If these high prices are not maintained, BLM projections for O&C county payments are overly optimistic.

Recommendation:

BLM should conduct economic analysis using a range of stumpage prices to forecast O&C county payments, with the range determined by the historic range of variability of stumpage and lumber prices.

Technological change

BLM's economic analysis does not adequately address technological change and the productivity increases that have occurred in the wood products and logging industries in the last two decades, and are likely to continue. The strength of productivity change is illustrated by the case of Washington State: *"…[B]etween 1980 and 1990 employment in Washington's sawmill industry declined by almost 14 percent, and between 1990 and 2000, employment declined by 20 percent. Lumber production in Washington State did not, however, decline by a corresponding amount, but instead increased by 27 percent between 1980 and 1990 and, by 11.5 percent between 1990 and 2000." (Helvoigt and Grosskopf 2000).*

The rapid rate of labor savings has been supported by rapid rates of productivity increases and technological change, averaging 2 percent annually between 1990 and 2000 (Helvoigt and Grosskopf 2005 and Helvoigt and Adams 2007). BLM is aware of this rapid increase in productivity, acknowledging that most of the employment loss of 11,000 workers in the Oregon wood products industry was due to "industry restructuring and changes in technology (DEIS, I, p. 243)". However, BLM's economic analysis appears to proceed with the assumption of no technological change over a ten year period. There is no mention of how or if BLM accounts for technological change in the description of

the Western Oregon Model nor of the County Level Input-Output Models (DEIS, III, Appendix C). BLM claims of fewer job losses under Alternatives #1 and #2 and actual employment increases under Alternative #2 do not appear take into account the decline in employment in the logging and wood products sectors that are most likely to occur because of technological change. BLM estimates of increased employment are estimates are therefore overestimates of any job gains from increased BLM harvesting.

Recommendation: BLM should specifically incorporate technological change and productivity increases into its economic models and clearly document and report how it accomplishes this.

Employment Losses and Gains

BLM claims that 45,000 jobs direct and induced jobs were lost as a result of implementation of the Northwest Forest Plan (DEIS, I, p. 243), including 7,500 jobs in the logging industry and 22,500 jobs in primary wood industries. It attributes these job losses to reduced timber harvest from federal land. In addition, it claims that 19,000 jobs were lost in the region between 1990 and 1994, because of reduced volumes of timber harvest. These claims are overstated for two reasons.

First, the estimates are based on models that do not allow for employment increases due to the prospects of improved natural amenities and other factors. Yet this appears to be what has happened. In evidence of this, Kerkvliet et al. (2007a and b) examine employment growth in Oregon, Washington, and Northern California counties containing land reclassified by the Northwest Forest Plan. They find empirical evidence

that counties containing a higher proportion of land restricted from timber harvests in order to promote biodiversity (late-successional old-growth or riparian reserves) actually experienced faster employment growth than counties with a greater proportion of matrix land available for harvest (Kerkvliet et al. 2007a). A one percent increase in the share of a county's land allocated to biodiversity conservation uses correlates with a .73 percent higher rate of growth in employment. Kerkvliet et al. (2007b) find that this comparatively faster growth in employment is strongest for rural counties. This evidence suggests that implementing the Northwest Forest Plan and restricting timber harvesting on public land in order to promote biodiversity conservation actually led to increased numbers of jobs, not the decrease in employment claimed by BLM.

Second, BLM does not account for the significant role of technological change in employment changes in the forestry and wood products sector. Helvoigt and Adams (2007) find that 38 percent of recent employment losses in the Pacific Northwest sawmill industry were due to changes in productivity and technological improvements. Of the remainder some of the job losses were due to industry restructuring, wherein inefficient sawmills reduced output or closed, and OSB producers gained market share against Pacific Northwest plywood producers. These forces are implicitly acknowledged by BLM when it notes that "11,000 job losses occurred between 1994 and 2000, even though the volume of wood available for manufacturing stabilized and even rose slightly (DEIS, I, p. 243)"

Recommendation: BLM incorporate all the available evidence of the effect of reserving public land for conservation purposes and technological change into its analysis of Oregon employment.

Limited Market for Large Logs

BLM proposes to increase harvests of large logs and claims that an increasing proportion of these larger logs will result in an increase in average stumpage prices received for BLM timber. BLM states: "As a result of the differences in the type of harvesting…and log quality, there is a difference in the projected average stumpage prices between the alternatives (DEIS, II, p. 536). Under BLM's Alternative #2, the adjusted average stumpage price is given as $280 per thousand board feed (MBF), compared to $234 per MBF under the No Action Alternative (DEIS, II, Table 154, p.537). The stumpage price differential translates directly into BLM's revenue estimates and BLM's estimates of payments to O&C counties. If stumpage prices for Alternative #2 were the same as stumpage prices under the No Action Alternative, BLM projected revenues would fall from $215.8 million to $179.4 million and the difference in revenues between the two alternatives would decrease from $131.9 million to $95.5 million, or 28 percent. (*Note: there appear to be minor errors in Table 154 in calculating revenues. Revenues (in millions) under Alternative # 2 should be $214.76=767 x 280, not 215.8; revenues under the No Action Alternative should be $83.07, not $83.9*)

It is likely, however, that BLM will have difficulty in finding markets for these logs and even if bidders on timber sales are available, it is likely that large log stumpage

prices per MBF will be equal or lower, not higher, than prices for the smaller uniform-sized logs being harvested on Oregon industrial forest land. The market for large logs is limited. Only three mills in western Oregon specialize in processing large logs. Dombeck and Thomas, both former U.S. Forest Service Chiefs, note "few sawmills remain in business that can process large old-growth logs. The mills that have survived are geared to efficiently process smaller second-growth trees."

Industrial forestland owners are producing smaller, uniform-size logs on short (30-50 year rotations) and most mills have retooled to use these logs as input. John Bliss, Professor of Forest Resources at Oregon State University's College of Forestry writes: *"In the Pacific Northwest, forest industry's shift to growing shorter rotation, smaller diameter Douglas fir has nearly eliminated the market for large, high quality logs. Mills capable of processing large logs are now scarce." (Bliss 2003).*

Eric Hansen, also professor at Oregon State University's College of Forestry concurs, *"The mills shifted their manufacturing strategy to streamline production. They can process small logs more quickly and effectively than larger logs. As a result, many Oregon saw mills won't accept large logs (Hansen 2003)."* Larry Mason, of Washington State University's Department of Natural resource has analyzed relative prices and found that stumpage prices for smaller logs have increased while prices for larger peeler logs have declined relatively (Mason 2002).

Not only have most Oregon sawmills retooled to best process smaller, uniform-sized logs, but other sources of demand for large logs have become weaker. Demand for construction plywood has been usurped by demand for oriented strand board (OSB) in

many construction uses. Demand in the log export market, which used to add a premium for large logs, has become much weaker in the face of changing tastes and construction codes in Asia (Wagner et al. 2003). What BLM characterizes as a standard commodity market for large logs, is best characterized as "complicated", with few specialized producers bucking the technological trend of using small-diameter, uniform log inputs in highly competitive commodity market. Hansen (2003) suggests that markets for large logs need to be nurtured and that this may require substantial investments in public and private funds.

BLM notes, "Much of the recent investment in Oregon mills focused on more efficient processing of the smaller lands harvested from private lands (DEIS, I, p. 236). Helvoigt and Grosskopf (2005) find that technological change, productivity increases, and small logs are linked in Pacific Northwest sawmilling: "*The decline in the size and quality of logs over the study period is widely believed to have increased sawmill productivity. Although less valuable, the processing of smaller logs is less labor intensive and more amenable to mechanization"*

We were unable to find any information to verify BLM's claim that additional investment is being made in large log capacity (DEIS, I, p. 237). In today's environment the vast majority of sawmill investments are being made to process small logs and it is unlikely that investors would suffer the decreases in productivity alluded to by Helvoigt and Grosskopf (2005) if they invested in large log milling capacity. BLM's assumption that it will find a market for large logs with a premium stumpage prices resulting from harvesting older trees is problematic. Price premiums have all but disappeared for large

logs and it is likely that it will become increasingly difficult to market these logs, given the types of investments are being made in Oregon's sawmilling capacity.

Recommendation: BLM should provide adequate documentation to justify the stumpage price differences between alternatives, especially the highest price assumed under Alternative #2. BLM should address the possibility that it will have a difficult time finding markets for large logs at reasonable stumpage prices.

Inadequate Range of Economic Scenarios

BLM economic analysis appears to have been conducted using only one economic scenario. BLM did not conduct sensitivity analysis by varying any of the numerous macroeconomic factors affecting credit markets, housing markets, and international trade, and reporting the sensitivity of its results to changes in these factors. As a result, BLM predictions of O&C county payments, employment, and personal income do not consider the historic range of variability in its projected revenues, O&C payments, employment, and personal income. Since the assumptions used by BLM in its economic models appear to produce near-historical highs for stumpage prices and lumber demand, it is likely that BLM predictions for revenues and O&C payments to counties are highly optimistic.

To illustrate a case BLM did not consider, consider the following United Press International story from October 17, 1981:

"For the second consecutive week, more than half of the West's sawmill workers were unemployed or working short shifts last week, industry figures showed, while 39 more mills were closed down. The Western Wood Products Association reported yesterday that

52,175, or 51 percent, of the 102,000 sawmill employees in the Western lumber industry were out of work or on curtailed shifts during the week ending Oct. 10. During the previous week, 54,900, or 54 percent, were unemployed or on short hours."

This story provides a graphic example of the volatility of the market for wood products—a volatility BLM has apparently chosen to ignore.

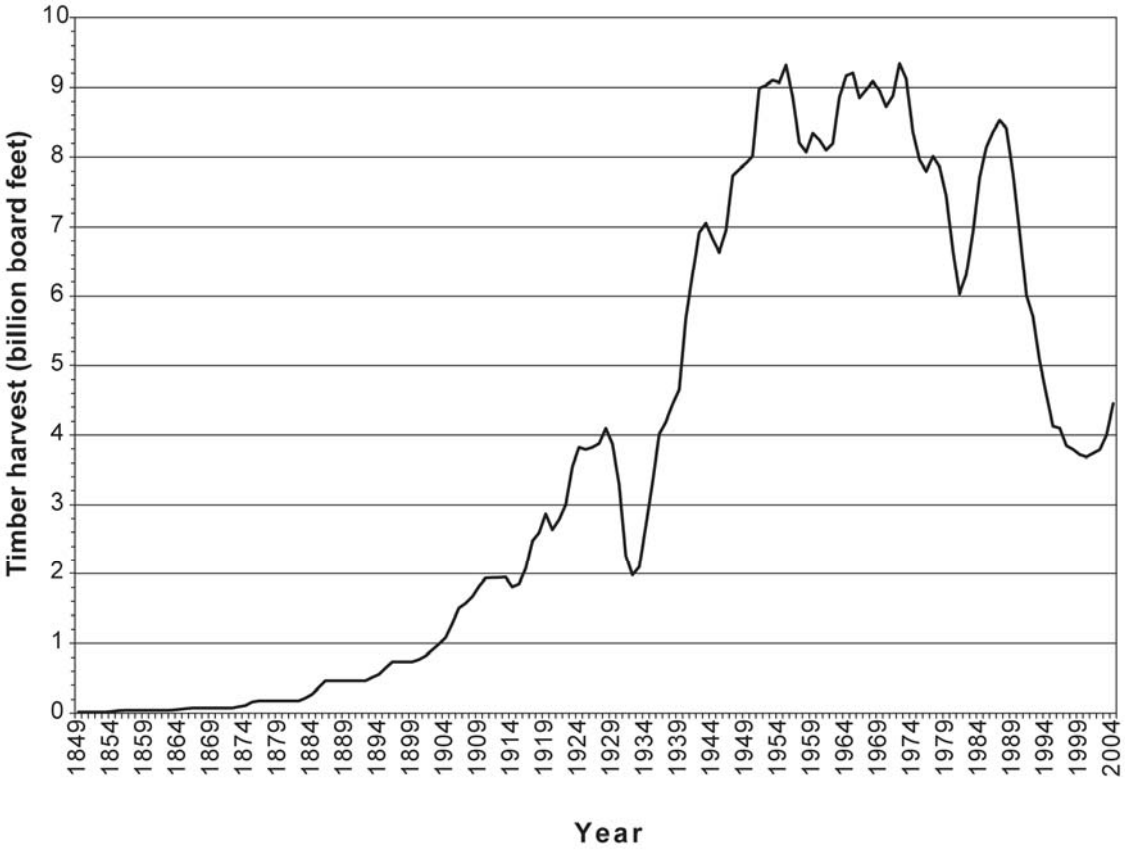

Figure 1: Oregon Timber Harvests—three year moving average. Source: Andrews and Kutara 2005.

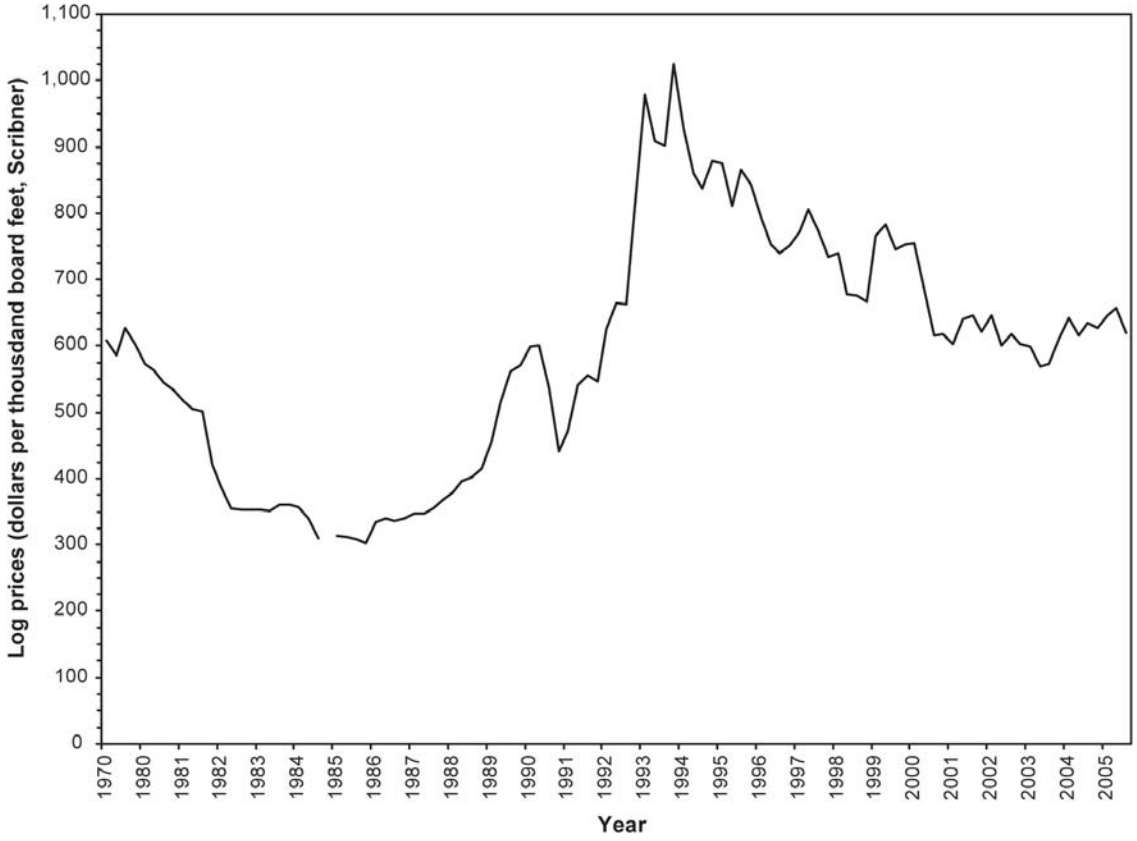

Figure 2. Quarterly adjusted delivered softwood log prices in Oregon in 2005 dollars. Source: Oregon Department of Forestry 2005.

There are several sources of volatility in wood product's markets. Figure 1 above illustrates one source of volatility in Oregon timber markets—the quantity harvested. Figure 2 above illustrates another source of volatility—the sales price of harvests. In many cases this volatility is due to macroeconomic factors such as interest rates, the exchange value of the dollar, and other real estate market conditions. BLM's economic analysis appears to be grounded on a 14 year high point in the timber and lumber market. Even now (December 2007) housing market conditions have degraded. The volatility in

both price and quantity of logs illustrates that the certainty with which BLM characterizes its O&C payments to counties is not warranted.

Another source of volatility in BLM revenues and, hence, O&C payments, is litigation. Harvest quantities are also subject to considerable volatility because of the risk of litigation (Fattig 2007). As BLM offers more late successional old-growth forest and riparian stands for sale, the probability of administrative appeal and litigation increases. Dombeck and Thomas (2003) note; "harvest of old growth will be publicly resisted in sequential and predictable steps -- appeals, legal actions, protests and, in the end, civil disobedience. In the Pacific Northwest, where most old-growth remains, costs of making old-growth timber sales are disproportionately high with very low chance of ultimate success given environmental constraints and process requirements. Ten-year-old plans that envisioned some old-growth harvest have been overcome by events -- legal, political, social, scientific and economic."

Even while following the Northwest Forest Plan guidelines, litigation and administrative appeals have been a problem for BLM. For example, the BLM's Medford District attempted to offer 57 MMbf for sale in 2007, was only able to sell 15.8 MMbf, and only 5.3 MMbf is actually available for sale near the end of the year (Fattig 2007).

Recommendation: BLM should conduct its economic analysis under several scenarios reflecting the historical range of variability in the market for wood products, including prices, volumes, and legal impediments to harvests. BLM should report the sensitivity of its projections for timber volume, stumpage price, revenue, O&C payments, and employment to this historic range of variability.

II. Inadequate Tools and Information

In many cases, BLM fails to provide sufficient information about the economic model or models it employs and fails to report results so that they may be judged for their reasonableness and credibility. Specifically, BLM should provide more information in the following areas.

First, increase in stumpage volumes offered by BLM will have the effect of depressing stumpage prices. BLM needs to clearly specify what parameter values it uses for various supply and demand elasticities to capture these price effects on private stumpage markets, justify the use of these parameters, and report the predicted stumpage price changes by county, by forest land owner type, and by year.

Second, increases in stumpage volumes offered by BLM will depress stumpage prices. This will likely result in reductions in the volume of timber offered by private forest land owners, and, perhaps, the revenue received by these forest land owners. BLM needs to specify the supply and demand parameters used in its economic model to determine the decreased volume from other forest land owners, the specific amounts by which private timber offerings are predicted to decrease and in what counties, and the resulting effects on revenues, profits, and employment in the private sector.

Third, similar effects on timber volumes and/or stumpage prices can be expected for other federal land management agencies, State of Oregon Department of Forestry, and tribal forest land managers. BLM should report the effects of its increased sales volume on revenues, profits, and employment in for these agents. In the case of the U.S. Forest

Service, a decrease in stumpage prices will result in decreases in this agency's payments to O&C counties, and thus offset some of the increases in O&C payments projected by BLM in DEIS II (p. 537). BLM should report specifically the projected decreases in Forest Service payments by county and by year.

Fourth, increases in the stumpage volumes offered by BLM will have the effect of decreasing the price of logs relative to prices for other inputs, including labor, capital, materials, and energy. A possible result of this decline in the relative price of logs is that mills substitute logs for other inputs. To the extent that this happens the markets for other inputs will be affected. Employment, for example, might decrease as the stumpage price decreases and mills substitute less expensive raw material for workers (see Merrifield and Haynes 1984; Latta and Adams 2000). BLM needs to specify how the production technology used in its economic model takes into account these substitution possibilities and justify its specification based on the best econometric estimates of the relevant parameters.

Fifth, BLM has not revealed how it accounts for the impacts of changes in the product market structure on stumpage prices and BLM revenues. Growth in OSB share has led to a decline in the plywood market and a resulting narrowing of the gap between peeler grade logs and commodity logs. Since OSB's market share is likely to increase over the next decade, it is also likely that the small premium paid for peeler logs (from old-growth trees) will disappear. This will further decrease the revenue BLM can expect from its timber. BLM needs to clearly explain how these likely effects are taken into account in the economic models it uses and how BLM's revenue projections are affected.

Sixth, increasingly the markets for wood products, and even logs, are international. Canadian lumber competes heavily in U.S. markets. Export markets for Pacific Northwest logs have been strongly impacted by economic conditions in Asia, Canada, and Russia (Wear and Murry 2004; Daniels 2005). Also, logs from other countries are increasingly imported into the Pacific Northwest for processing. BLM has failed to explain how these international markets have been accounted for in its economic models. BLM has not reported its implied assumptions about international conditions, export and import restrictions, and the value of the U.S. dollar. BLM needs to report specifically the assumptions it has employed in its economic models to account for salient international events.

Seventh, BLM needs to show that its use of IMPLAN can yield useful and defensible predictions of the socioeconomic impacts of its actions. BLM needs to show that IMPLAN, or a modified version of IMPLAN, will not yield inaccurate and/or biased estimates of potential impacts. While the IMPLAN model can be a useful tool to develop static analyses of a regional economy, it has severe shortcomings and a poor track record as a predictive tool, especially in the case of the PNW. Niemi et al. (1999) report on five studies using IMPLAN to forecast employment losses resulting from reduced harvests on federal land in the Pacific Northwest (Niemi 1999). Each study inaccurately predicted extreme employment losses which did not materialize. Since these studies over predicted employment losses due to reductions in federal timber harvest, it is likely that BLM's use of IMPLAM will result in an over prediction of the employment gains what will result from increasing its timber harvests.

IMPLAN takes an economic base approach to regional economic modeling, and Haynes and Horne (1997) note this weakness: *"Where the economic base approach gets into trouble is when it is used inappropriately as a tool for planning or predicting impacts of greater than one year in duration; a snapshot of current conditions tells little about the form a region's future economy may take."*

IMPLAN makes the assumption that the economy is static, that there will be no changes in relative prices, no input substitutions or technological change in the relevant production processes, no labor mobility, no regional in- or out-migration, and no changes in state and local taxes or regulations. Also, IMPLAN does not consider the impacts of many important variables that affect economic growth in Oregon. The impacts of changes in natural amenities resulting from BLM actions are not captured in IMPLAN. IMPLAN completely fails to account for retirement or investment income or changes budgets of the public sector. Hoekstra et al. (1990) and the Office of Technology Assessment (1992) suggest that IMPLAN is an inadequate tool for evaluating overall economic impacts of changes in regional natural resources. An especially salient detail that IMPLAN ignores is the likely negative impacts of increased harvests of late-successional old-growth and riparian reserves on other important sectors of the economy, such as recreation.

Recommendation: BLM needs to more fully explain its economic modeling strategy, report and justify the relevant parameter values it has used in its economic model. BLM needs to report the sensitivity of its results to assumptions about external

international conditions. BLM needs to find an alternative to using IMPLAN to predict changes over the next decade.

III. Economic Analysis the BLM did not do.

BLM's socioeconomic analysis fails to consider other important drivers of the Oregon economy and how more intensive extraction-based management of BLM lands in western Oregon is likely to reduce the ability of these drivers to contribute to a strong, sustainable economy in western Oregon. Recent research indicates that the economies of many areas of the west, including Oregon, are no longer much dependent on resource extraction, including logging (Rasker et al. 2004). Moreover, utilizing natural resources to their full advantage requires than public land be protected and restored so it can contribute to the areas natural amenities. These natural amenities contribute to local and regional economic prosperity and stability (Power 1996; Kerkvliet et al. 2007a and 2007b; Duffy-Deno 1998; Whitelaw et al. 2003; Homes and Hecox 2004; Marcouiller and Deller 1996).

The important role of conserving natural resource in local, state, and regional economies was highlighted recently by 99 economists writing to the President, who noted*: "The West's natural environment is, arguably, its greatest, long-run economic strength. The natural landscapes of the western states, with wide open spaces, outdoor recreational opportunity, and productive natural-resource systems underlie a quality of life that contributes to robust economic growth by attracting productive families, firms and investments (Whitelaw et al. 2003, p. 1).*"

Numerous researchers now argue that conserving natural resources, rather than extracting them, managing public land for conservation uses may actually improve local

economies and the empirical evidence supporting their argument is growing (Power 1996, Duffy-Deno 1998, Lorah 2000, Niemi et al 1999, Power and Barrett 2001, Charnley 2006a, Power 2006; Kerkvliet et al. 2007a and 2007b). This process may work in any of four ways.

First, conserved lands and their associated natural amenities may attract new businesses. Entrepreneurs in many fields, especially high-tech and knowledge-based, are often free to choose their locations and they are likely to gravitate towards high amenity areas (Snepenger et al. 1995; Beyers and Lindahl 1996; Henderson and Abraham 2004). Entrepreneurs who provide producer services especially are expanding into rural areas and most conduct much of their business inter-regionally or internationally. Such firms hire workers in high wage occupations such as computer programming, data processing, engineering and financial services. Most of these businesses are not location dependent and entrepreneurs often choose their location based on the amenities available (Beyers and Lindahl 1996).

Business location decisions are made on the basis of numerous variables that can often be classified in two main groups: labor supply and quality of life. Included in labor supply are access to universities, technical training, and diversity. Both entrepreneurs and potential workers are drawn by a high quality of life, including access to outdoor recreation and natural beauty (Moretti 2007). One extensive study of business location decisions (Salvenson and Renski 2002) concluded: *"For rural places, the most likely beneficiaries of the New Economy will be those places with outstanding natural amenities or rural areas on the metropolitan fringe."*

Second, conserved lands provide production inputs for recreation and other natural amenity-based enterprises (Marcouiller and Deller, 1996), including recreation, ecotourism, and education. Recreation, for example, plays an increasingly important role in Oregon's communities. Outdoor recreation spending contributes $5.8 billion to the Oregon economy, with its $4.6 billion in retail sales making up 3.4 percent of the state's gross product. Over 73,000 jobs in Oregon provide services and products to the outdoor recreation industry and the state obtains $310 million in tax revenue from this industry (Outdoor Industry Foundation 2007). An April 2004 report from the Federal Reserve Bank of Kansas City's Center for the Study of Rural America calls wildlife-based recreation "rural America's newest billion-dollar industry" (Henderson 2004).

A recent study by the U.S. Department of Agriculture (Reader and Brown 2005) finds that rural counties with a greater recreational component to their economies have performed better than other rural counties over the past decade. Reader and Brown (2005) summarize their findings as follows: *"…[R]ecreation and tourism development contributes to rural well-being, increasing local employment, wage levels, and income, reducing poverty, and improving education and health (abstract)."*

An especially important natural amenity which serves as a direct or indirect input to local businesses is wilderness. A recent report by the Sonoran Institute (2004) found that: "Protected lands have the greatest influence on the economic growth of rural isolated counties that lack easy access to larger markets. From 1970 to 2000, real per capita income in isolated rural counties with protected land grew more than 60 percent faster than isolated counties without any protected lands." Recent survey results also

indicate that many firms decide to locate or stay in an area because of scenic amenities and wildlife-based recreation, both of which are strongly supported by wilderness areas (Morton 2000). In a study to determine the economic value of federal lands in the Interior Columbia Basin, Haynes and Horne (1997) concluded that the services derived from roadless areas constitute 89 percent of the economic value of federal land. Timber constitutes only 11 percent of the total value.

Third, firms may be attracted to a pool of workers, who, by migrating, have expressed the willingness to trade income for natural and other amenities (Roback 1982). Studies show that a substantial portion of people who move are motivated in large part by the natural and social amenities at their destination (McGrannahan 1999; Shumway and Otterstrom 2001). McGrannahan (1999) found that population change from 1970 to 1996 averaged one percent in counties with low natural amenities, but 120 percent in counties with high natural amenities. Lorah (2000) and Lorah and Southwich (2003) find a strong correlation between a counties growth in population due to migration and the local or adjacent natural amenities, including protected lands.

A report on migrants to Oregon in the 1990's reported that a high proportion of Oregon in-migrants listed amenities as the only reason for moving to Oregon. Over 50 percent of migrants to Oregon's South Coast and Central Oregon cited amenities as the sole reason for their re-location decision (Judson et al.1999). Other migrants listed amenities as contributing to their location decision. As migrants arrive, they attract firms seeking a quality workforce. In addition, migrants demand goods and services and provide customers for local businesses. As noted by the authors of this study,

"…[N]atural amenities can promote migration and further job growth…(p. 25)"

Fourth, conserved lands and their associated amenities attract new residents with external sources of income (Lorah 1999; Charnley 2006a). Retiree's have been a strong component of Oregon's recent population growth and are likely to remain so in the future as this population cohort grows. Over 80 percent of retiree migrants to Oregon cite amenities and not jobs as their impetus for choosing Oregon as their migration destination (Judsen et al. 1999). Retiree's bring knowledge, skills, culture, and importantly non-wage income with them and attracting retirees has proven to be a powerful economic strategy. Judson et al. (1999) summarize the important role of retirees in building local Oregon economies: *"Results from Oregon suggest that retirees (1) bring wealth to the community in the form of income and asset transfers; (2) stabilize the business cycle; (3) demand less State aid and less of costly public services; and (4) add to the pool of available capital via equity and pension income and wealth (p. 30)".*

BLM's proposed increase in logging and decreased protection of public land is inconsistent with the direction of economic change in Oregon. BLM's Preferred Alternative #2, especially, has the potential to derail the economic prosperity Oregon has nurtured in the past decade. BLM's Alternative #2, especially, will decrease the area of protected land and thereby erode the natural amenities so important to Oregon's recreation industry. Eroded natural amenities have the potential of causing businesses to eschew Oregon or established businesses to leave. Eroded natural amenities are likely to lead to reduced in-migration and a smaller skilled workforce to attract new businesses. Eroded natural amenities will reduce the flow retiree's migrating to Oregon.

Recommendation: BLM re-evaluate its obsolete view of the role managing public land mainly for extractive purposes and consider the strong evidence on the important role played by natural amenities, especially those derived from protected public land, in Oregon's economic stability and prosperity.

IV. Ecosystem Services

BLM's economic analysis fails to give any consideration the values of the plethora of ecosystem services provided by old-growth and mature forests in Oregon. In fact, BLM acknowledges several types of these values ("wildlife, recreation, water quality") and then chooses to ignore them, stating "The nonmarket values (e.g. wildlife, recreation, and water quality are not included in this analysis (DEIS, I, p. 216)." Nevertheless, these ecosystem services are extremely important to the economic prosperity and stability of local and regional economies, although many of them are "non-market" in the sense that they are not regularly traded in formal markets (World Bank 2005).

Ecosystem services include the following: Production and regulation of water, formation and retention of soil, regulation of climate, regulation of natural disturbances, mitigation of human-caused disturbances, regulation of nutrients, degradation of pollution, provision of habitat, production of edible plants and animals, pollination of wild and cultivated plants, biological control of pests and disease, production of and storehouse for genetic information, production of non-timber forest products, production of recreational resources, production of spiritual, cultural, and historic resources, provision of natural control environments for scientific investigation, provision of inputs

for education (see Daily 1997; Degroot et al. 2002; Postel and Carpenter 1997; Myers 1997; ECONorthwest, 2006).

The values of some of these ecosystem services are difficult to measure, but others have been extensively studied by natural and social scientist and peer-reviewed estimates of their values are readily available to BLM. Compared to the BLM's dismissal of ecosystem services from its economic analysis, much more complete valuation of the myriad ecosystem services are being accomplished in resource decisions throughout the world (see, for example, Naidoo and Ricketts 2006; World Bank et al. 2005). BLM also has available numerous, well-established methodologies that it could use to provide a more complete estimate of the ecosystem values provided by Oregon forests managed by BLM (see Freeman (2003) for a thorough discussion).

Existing research, available to BLM, contain the following discussions of the ecological and economic values of ecosystem services provided by PNW forests.

Old-Growth Forests

Little of the old-growth forest formally covering the PNW remains, but what does remain is held in high regard for its ecological and socioeconomic values. A large and growing number of people prefer to preserve these forests for posterity. This "bequest" value is "as real as those determined for commodities in the marketplace and clearly exceed the values as timber (Dombeck and Thomas 2003)". Recent research indicates that Oregon residents hold strong preferences for increasing old-growth forests in the Oregon Coast

Range. A 2004 choice experiment survey of Oregonians revealed the highest willingness to pay among ecosystem management options for Oregon's Coast Range was for increasing the amount of forest devoted to achieving old-growth characteristics. On average, respondents indicated an annual household willingness to pay of $380 to increase the percentage of old-growth forests from 5 percent to 35 percent of the age-class distribution (Garber-Yonts et al. 2003). The latter number is close to the projected outcome of 100 years of ecosystem management following the guidelines of the Northwest Forest Plan (Johnson et al. 2007; Spies et al. 2007).

A U.S. Forest Service study of the total value of goods and services from federal land in various parts of the Columbia Basin has concluded that the existence value (i.e. the value of simply having, but not using) of wilderness and other unroaded areas is a substantial fraction of timber values in all cases (Niemi et al. 1999; Haynes and Horne 1997). In some cases, existence values exceed timber values. In the upper Klamath Basin, existence value was 21 percent of total value, while timber value was 49 percent. In the Cascades north of Upper Klamath Basin existence value comprised 15 percent of total value, while timber value comprised only 3 percent.

Habitat for PNW species

More than 1000 terrestrial species are associated with Pacific Northwest old-growth forests. These include over 500 fungi, 106 bryophytes, 157 lichens, 124 vascular plants, 102 mollusks, 18 amphibians, 38 bird species, 26 mammals (FEMAT 1993). Pacific Northwest old-growth forests contain the ranges of more than 100 stocks of salmon,

steelhead, and other anadromous fish which are already extinct. More importantly, Pacific Northwest forests contain the ranges of many fish stocks at risk of extinction. In addition, 200 species are dependent on quality aquatic environments in or near old-growth forests (FEMAT 1993).

There is strong evidence that the biodiversity protection provided by forests such as those in the Pacific Northwest provide important ecosystem services, including recycling of organic wastes, soil formation, bioremediation of harmful chemicals, a source of genetic material for developing medicines and hybrid plants and animals, and pest control. For example, Pimental et al. (1997) estimates that the values of the ecosystem services provided by biodiversity total $406 billion (2006 dollars) annually in the U.S. and over $3 trillion world wide. Pimental et al. (1997) does not provide a separate estimate of the value of biodiversity provision by Pacific Northwest forests.

Research provides evidence that logging degrades the quality of aquatic environments in many cases and thus degrades habitat for threatened and endangered species. Streams in logged areas are wider and contain more sediments that those in old-growth forests (Beechie et al. 2000). Water temperatures are higher and humidity is lower in logged areas compared to stream located in old-growth forests (Brosofske et al. 1997). Research also finds the converse, i.e. old-growth forests contain more species than logged forests (Corn and Bury 1989).

The economic values of protecting some species associated with old-growth forests have been estimated and are available to BLM in peer-reviewed journals. Even before the Northwest Forest Plan was implemented and at a time when controversy over

continued logging of PNW old-growth forests was raging, Rubin, et al. (1991) reported that Oregon residents expressed a willingness to pay $37 per household per year to protect northern spotted owl and the old-growth habitat they utilize. Washington and California residents also expressed household willingness to pay of $37 and $21, respectively (1991 dollars). The same authors estimated that all U.S. households were willing to pay nearly $2.14 billion (in 2006 dollars, adjusted by Producer Price Index) annually to ensure that northern spotted owls would exist in the future. Bulte and Van Kooten (1999) conducted a meta analysis of northern spotted owl valuation studies and found that U.S. households were willing to pay $22-$95 annually to prevent substantive reductions in the number of northern spotted owl pairs. With over 110 million households in this U.S., willingness to pay to pay aggregate to $3.5 billion to $14.6 billion (in 2006 dollars, adjusted by the Producer Price Index).

The reported estimates of willingness to pay to protect the northern spotted owl are consistent with other findings of U.S. households' willingness to pay to protect threatened and endangered species. In a review of 20 studies of the economic values Americans place on threatened and endangered species, Loomis and White (1996) concluded: *"To date, for even the most expensive endangered species preservation effort (e.g. the northern spotted owl) the costs per household fall well below the benefits per household found in the literature."*

This result mirrors a recent study of the costs and benefits of implementing forest practices rules designed to protect and enhance salmon habitat in Washington. A study conducted by the Washington Department of Natural Resources (2006) concluded that

the probable per acre benefits of protecting over 2000 acres of northern spotted owl habitat were $43,000-$79,000, while the probable costs ranged from $14,000-$29,000 (in 2006 dollars). Similarly, Perez-Garcia (2001) found that the $9.1-$13.3 billion benefits of forest-practices rules to protect and enhance salmon habitat exceed the $7.5-$8.5 billion costs of their implementation.

Salmon and steelhead are the iconic species of the PNW and their continued existence is valued by Oregonians and others. Loomis and White find that U.S. households express a willingness to pay of $38-$77 per year (in 2006 dollars, adjusted by the Producer Price Index) to increase populations of Pacific Northwest salmon. They also report that households' willingness to pay for salmon was higher than for any other fish. Fishermen highly value catching (and sometimes consuming) salmon and steelhead. Although fishing for salmon and steelhead has declined as fish populations have declined, the existing evidence suggests that each additional caught salmon or steelhead is worth over about $200 to sportsmen (Niemi et al. 1999). In a study to determine the economic value of federal lands in the Interior Columbia Basin, Haynes and Horne (1997) concluded that fishing has the highest value of all recreational activities.

The value of the diverse biota supported by Pacific Northwest forests in Oregon is also indicated by the amounts of taxpayers' dollars spent to insure their recovery under the Endangered Species Act. The table below presents the 2004 expenditures by all federal and state agencies for threatened and endangered species likely to be affected by BLM Preferred Alternative #2.

EXPENDITURES BY FEDERAL AND STATE AGENCIES TO PROTECT AND

RECOVER ENDANGERED SPECIES IN OREGON, 2004	
Upper Willamette Chinook Salmon	$8,061,536
Oregon and California Populations of Coho Salmon	$23,405,737
Oregon Coast Oregon Salmon	$9,207,050
Upper Willamette Steelhead	$6,323,800
Northern California Steelhead	$4,465,309
Marbled Murrelet	$5,646,695
Northern spotted owl	$,980,570
Source: U.S. Fish and Wildlife Service, 2004	

Water quality and quantity

Quality water in predictable quantities is one of the major ecosystem benefits provided by intact forest ecosystems (Myers 1997; National Research Council 2000). Economic research has established that Americans have strong preferences for high quality water resources and are willing to pay large amounts to protect or restore them (Wilson and Carpenter 1999). For example, Carson and Mitchell (1993) found that U.S. households are willing to pay over $100 billion dollars (in 2006 dollars, adjusted by the Producer Price Index) annually to bring all U.S. water bodies up to at least swimable quality.

Water quality degradation has been shown to adversely impact the value of real estate throughout the country (Wilson and Carpenter 1999; Michael et al. 1996; Doss and

Taff 1996) and people express their actual willingness to pay for higher quality water in their travel and sporting expenditures (Cameron et al. 1996; Bowker et al. 1996).

National Research Council concluded that "Changes in management as a result of adopting the [Northwest Forest Plan] will have beneficial effects on the overall average quality of water flowing from the regions forests and some effect on the timing of flows (pp. 156-157)". BLM plans for logging of old-growth and decreasing riparian buffers will reverse some of these beneficial effects. Officials of the U.S. Environmental Protection Agency have expressed concern that the improvements in water quality on federal lands resulting from application of the Northwest Forest Plan will be curtailed or even reversed if management directions consistent with BLM's Preferred Alternative #2 are adopted (Gearheard 2007).

In low-lying coastal areas especially, conversion of old-growth forests to younger stands are likely to decrease water supplies by as much as 30 percent. This is because fog moving though forests often induces water vapor to condense and fall to earth. This increases ground and surface water, especially during late summer when stream flows are low (Franklin and Spies 1991) The available evidence suggests that precipitation on old-growth forest land exceeded that from clearcut land by 25-29 percent because of the larger leaf areas in old-growth forest stands (Harr 1982). In Oregon coastal forests, annual precipitation was found to be 20 inches greater under old-growth forests than in clearings (Isaac 1946). Reduced stream flows imply reduced economic values. Brown (2004) finds that the marginal value for an acre foot of water in the Pacific Northwest is over $50.

National Research Council (2000) recognized the importance of dependable supplies of clean water for Oregon communities: “Supplying residential and community water continues to be an important concern of forest management. Portland…, as well as many smaller communities in the region, depends on protected watershed for their water (pp 156-157). Portland, Salem and Corvallis are among the many Oregon cities depending on water from forest lands for much of their municipal water supplies. BLM proposed actions will impair these water supplies by increasing sedimentation and algal biomass leading to increased treatment costs. For example, having access to clean water, requiring minimal treatment, was found to save Salem resident $18-$34 per capita per year (Hulse et al. 2002). Algal biomass was found to be 7-14 percent higher in headwater streams of logged areas compared to old-growth forest areas (Kiffney and Bull 2000).

Numerous studies show that sedimentation increases in logged areas, especially clearcutting (Fredriksne et al 1973). For example, in the Oregon Cascades, Grant and Wolff (1991) found that average annual sediment production in clearcut areas was 12 times pre-cut levels. Their empirical model suggests that sediment production would not return to pre-cut levels for 30 years. Sediments impose real costs in the form of decreased recreation opportunities and health, reduced soil fertility, additional water treatment costs for municipalities and households. Ribaudo estimates each ton of sediment imposes costs of about $5.00 (2006 dollars), while Pimental et al (1995) estimates each ton costs society about $12 (2006 dollars). Using a 4 percent discount rate, Grant and Wolff’s estimates of increased sediments, suggests that clearcutting a acre

of forest sets of a sedimentation process costing from $296 to $710 (2006 dollars) (see Niemi et al. 1999 for details).

One way of putting these costs in perspective is to consider the 143,000 acres of clearcuts BLM proposes in the first decade under its Preferred Alternative #2. Given the range of costs per acre, BLM's proposed clearcutting would result in $42 million to $100 million in sediment costs on Oregon businesses, households, and governments.

Oregon cities and towns are likely to bear an important component of these estimated costs. For example, a 1988 study found that logging 87,000 acres would cost local governments $770,000 to remove sediments from municipal water supplies and roads (Loomis 1988). A recent storm event in a watershed being logged above Falls City, Oregon resulted in the community water treatment plant being shut down because of high sediment loads (Casper 2007).

These estimated costs of sediment above do not include the costs of increases in the flow of flood water from forestland resulting from logging, especially clearcutting, and the associated roads. Compared to logged forest land, old-growth forests show 33-55 percent reductions in peak flows following storm (Jones and Grant 2001). Jones and Grant (1996) find that logging increases peak discharges by as much as 50 percent in small water basins and 100 percent in large basins. The economic costs of increased peak discharges have not been quantified to our knowledge.

Other researches have shown that harvesting in riparian areas has adverse effects on the ability of water resources to deliver ecosystem services. Brosofske at al. (1997) show that stream microclimate, including temperature, is adversely affected by harvest,

and concluded “that a buffer of at least 45 m on each side of the stream is necessary to maintain a natural riparian microclimatic environment along streams in our study, which were characterized by moderate to steep slopes…. [But] required widths may extend up to 300 m…(abstract)” depending on other factors.

Recreation

Old-growth forests, and their associated unroaded areas, high quality water and wildlife provide important inputs to the outdoor recreation industry and the value of recreation is an important component of the total value of services provided by public land in Oregon. Outdoor recreation spending contributes $5.8 billion to the Oregon economy, with its $4.6 billion in retail sales making up 3.4 percent of the state’s gross product. Over 73,000 jobs in Oregon provide services and products to the outdoor recreation industry and the state obtains $310 million in tax revenue. Oregon outdoor recreation participants depend on high quality public land for their enjoyment. Over 1.1 million outdoor recreationists use trails for hiking, backpacking, and climbing and 1.3 million take part in wildlife viewing. In addition there are nearly 1million campers, .5 million fishermen, .4 million rafters, canoeists, and kayakers, and .2 million hunters. Forest Service researchers estimated the value of goods and services provided by federal lands between the Cascades and the Rockies. Their findings show that recreation accounts for 30 and 70 percent of total economic values derived from these lands (Haynes and Horne 1997). One study found that the recreational value of additional hiking trails in Pacific Northwest old-growth forests was $1254 per mile (1990 dollars) (Englin and Mendelsohn 1991).

Climate Moderation and Carbon Sequestration

BLM has inappropriately chosen to ignore the important ecosystem service of carbon (C) sequestration in old-growth forests. This omission is inconsistent with the substantive ecosystem service provided by Pacific Northwest old-growth forests. It is also inconsistent with the vision of other federal land managers and with the policies of the State of Oregon.

Consider first, the important role of Oregon forests in the concentration of carbon dioxide (CO_2) in the earth's atmosphere. Harmon et al. (1990) report that *"conversion of old-growth forests in the Pacific Northwest has been a significant source of C in the atmosphere….Given the small area we are considering, a mere 0.017% of the earth's land surface, old-growth forest conversion appears to account for a noteworthy 2% of the total C released because of land use changes in the last 100 years (p. 701)"*.

The large proportional release compared to the small area results from the ability of an acre of Pacific Northwest old-growth forests to store substantive amounts of C. Harmon et al. (1990) report that an acre of 450 year-old old-growth forest populated by Douglas fir and western hemlock contains about 248 metric tons of C in branches, wood and bark, roots, coarse woody debris, and soils. Conversion of such old-growth forests to a forest managed with a 60-year rotation will result in the loss of approximately 123.5 metric tons of C per acre.

BLM proposals to log old-growth forests will result in substantial economic losses in the form of reduced C storage. Others, including state, federal, and local

agencies and private agents, may have to make up for these losses. An estimate of the economic losses in the next decade can be obtained by examining the alternatives proposed by BLM. In Table 1, we estimate the losses of sequestered C from only two sources: clearcuts of stands 160+ years-old and permanent forest roads under the No Action and Alternatives #1, #2, and #3. Additional losses of sequestered carbon are likely to occur as a result of reducing riparian buffers. As shown in Table 1, Alternative #2 would entail the loss of over 7 million metric tons of sequestered carbon from clearcutting 58,000 acres of old-growth and .74 million metric tons of sequestered carbon from building additional roads.

TABLE 1: CARBON AND ECONOMIC LOSSES				
Proposed Clearcuts First Decade (Acres)[1]				
Age	No Action	Alternative #1	Alternative #2	Alternative #3
160-180 years	10500	18200	23700	400
200+	4600	15800	34800	2300
Total Clearcut	15100	34000	58500	2700
C lost[3]	1,864,850	4,199,000	7,224,750	333,450
Economic Value Lost[5]	$21,592,290	$47,868,600	$82,362,150	$3,801,330
Proposed Permanent New Roads (Acres)[2]				
	1900	2800	3300	3000
C lost[4]	427,690	630,280	742,830	675,300
Economic Value Lost[5]	$4,875,666	$7,185,192	$8,468,262	$7,698,420

1. BLM, Vol. II, pp. 578-582.
2. Estimated from BLM, Vol. II, Figure 197, p. 585
3. Assumes loss of 305 Metric tons per hectare, or 123.5 Metric tons per acre (Harmon et al. 1990 p. 701)
4. Assumes loss of all C except soil C, or 556 Metric tons per hectare (Harmon et al. Table 1.)
5. Assumes value of $11.40 per metric ton of C. Based on $3.10 per Carbon

Financial Instrument or 1 Metric ton of CO_2, the equivalent of .272 Metric ton of C (CCX Market Report, September 2007).

Markets for carbon savings in the United States are in their infancy. Nevertheless, carbon savings, including carbon offsets from various projects such as wind energy and carbon sequestration in forests, has a real, measurable economic value. For example, the CCX carbon market reports sales of over 500,000 metric tons of carbon in September 2007 with prices in the range of $3.00-$3.10 per metric ton of carbon dioxide, or about $11.40 per ton of carbon (Chicago Climate Exchange 2007). Based on this price, Table 1 reports an estimate of the economic value lost when old-growth forests are clearcut and permanent roads are built. For example, Table 1 shows that Alternative #2 would result in the economic loss of over $80 million from clearcutting 58,500 acres of old-growth of in the first decade and an additional $8.5 million from converting an additional 3300 acres to permanent roads.

One way to put these losses into perspective is to consider the additional revenue BLM projects it will raise under various alternatives compared to the No Action Alternative. BLM projects its stumpage revenues will increase from $83.9 million under the No Action Alternative to $215.8 million under Alternative #2, or a revenue increase of $131.9 million. However, this increase is diminished by the economic losses resulting from reduced C sequestration in old-growth forests. Table 1 shows economic value lost under Alternative #2 exceeds losses under the No Action Alternative by over $64 million. These additional costs may not be borne by BLM, but they are likely to be borne by

others as Oregon develops its strategy for greenhouse gas reductions (Governor's Advisory Group 2004).

The State of Oregon is committed to a strategy of greenhouse gas emissions reduction, especially carbon dioxide. The State is committed to arresting the growth in its greenhouse gas emissions by 2010 and achieving a 10 percent reduction below 1990 greenhouse gas emissions by 2020 (Governor's Advisory Group 2004). One of its four broad strategies for achieving "real, measurable, and meaningful reductions in …[Oregon's] greenhouse gas emissions" is increasing biological sequestration of carbon on forest and farm land (Governor's Advisory Group 2004).

Other federal agencies also recognize the importance of carbon sequestration. U.S. Forest Service is advocating a strengthening of the role of forests in carbon sequestration, hoping to double the contribution of public and private forests to offsetting U.S. carbon emissions by 2020 (Hall 2007). U.S. Forest Service recently signed a Memorandum of Understanding with the National Forest Foundation to establish a Carbon Capital Fund whereby individuals could purchase carbon offsets and contribute to national forest projects that would increase carbon sequestration (Friend of the Forest 2007). The advertised price per metric ton of carbon is $6.00.

Recommendation: BLM should conduct an economic analysis that gives full consideration to the economic values provided by the Oregon forestlands it manages. BLM should estimate the loss of these values likely to occur with additional logging and disturbance of old-growth and riparian reserves.

V. Community Stability

BLM is proposing to revise the existing plan to replace the Northwest Forest Plan because it "has re-focused the goal for management of the BLM-administered lands to the objectives of its statutory mandate to utilize the principles of sustained yield management on the timber lands covered under the O&C Act of contributing to the *economic stability of local communities and industries*, and other benefits from such management to watersheds, stream flows, and recreation (DEIS, I, p. XLIII, and DIES, I, p. 3, emphasis added)." All evidence suggests that public land management agencies such as the BLM are not able to affect economic or social stability of communities, even when federal land comprises a large proportion of the land area surrounding local communities. Instead, macroeconomic variables affecting the larger economic environment at the national or international level drive local economies in Oregon and other western states.

Daniels et al. (1991) analyzed employment and wage income in western Montana communities with substantial proportions of federal land. They found that even perfectly stable harvest flows from federal land could not stabilize wood product employment or wage income in the face of significant external demand shocks. Burton and Berck (1996) find that national macroeconomic variables that influence wood products demand cause forest sector employment in Oregon, not vice versa. Burton (1997) find that neither national forest timber cut nor sold affected employment in forest-related sectors in Oregon, but macroeconomic variables, such as real gross national product and housing starts, did. Berck et al. (2003) examine the long-run impacts of changes in timber employment and participation in major federal poverty programs. They find that "the

employment base multipliers of timber employment are small and state (California) economic conditions are the principal driver behind local poverty. We are not aware of any studies which find empirical evidence for the claim that BLM's management actions, including increased and/or stable timber harvests, can have a substantive impact on community stability.

Recommendation: BLM re-consider its ability to make meaningful contributions to the local or regional economic stability by additional logging activity.

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