Policy Analysis Group — College of Natural Resources

Report No. 26 **August 2006**

Idaho's Forest Products Business Sector: Contributions, Challenges, and Opportunities

by

Philip S. Cook
and
Jay O'Laughlin

Policy Analysis Group — College of Natural Resources
Jay O'Laughlin, Director

College of Natural Resources Experiment Station
Steven B. Daley Laursen, Director

University of Idaho

The College of Natural Resources Policy Analysis Group (PAG) was established by the Idaho Legislature in 1989 to provide objective analysis of the impacts of natural resource proposals (see Idaho Code § 38-714). The PAG is administered by Steven B. Daley Laursen, Dean, College of Natural Resources.

Policy Analysis Group Reports

No. 1. Idaho's endowment lands: A matter of sacred trust. *J. O'Laughlin (March 1990).*

No. 2. BLM riparian policy in Idaho: Analysis of public comment on a proposed policy statement. *K.L. Johnson, C. Mosley, J.C. Mosley, and J. O'Laughlin* (June 1990).

No. 3. Idaho Department of Fish and Game's land acquisition and land management program. *C. Wise and J. O'Laughlin* (October 1990).

No. 4. Wolf recovery in central Idaho: Alternative strategies and impacts. *C. Wise, J.J. Yeo, D. Goble, J.M. Peek, and J. O'Laughlin* (February 1991).

No. 5. State agency roles in Idaho water quality policy. *A.C. Turner and J. O'Laughlin* (February 1991, with separate Executive Summary).

No. 6. Silver Valley resource analysis for pulp and paper mill feasibility. *J.G. MacCracken and J. O'Laughlin*, editors (October 1991).

No. 7. A national park in Idaho? Proposals and possibilities. *J.G. MacCracken and J.O'Laughlin* (June 1992).

No. 8. Design of forest riparian buffer strips for the protection of water quality: Analysis of scientific literature. *G.H. Belt, J. O'Laughlin, and T. Merrill* (June 1992).

No. 9. Analysis of methods for determining minimum instream flows for recreation. *T. Merrill and J. O'Laughlin* (March 1993).

No. 10. Idaho roadless areas and wilderness proposals. *J.G. MacCracken, J. O'Laughlin, and T. Merrill* (July 1993).

No. 11. Forest health conditions in Idaho. *J. O'Laughlin, J.G. MacCracken, D.L. Adams, S.C. Bunting, K.A. Blatner, and C.E. Keegan, III* (December 1993, with separate Executive Summary).

No. 12. Grizzly bear recovery in Idaho. *J.G. MacCracken, D. Goble, and J. O'Laughlin* (November 1994).

No. 13. Endangered Species Act at the crossroads: New directions from Idaho case studies. *J.O'Laughlin and P.S. Cook* (October 1995, with separate Executive Summary).

No. 14. Idaho water quality policy for nonpoint source pollution: A manual for decision-makers. *J. O'Laughlin* (December 1996, with separate Executive Summary).

No. 15. Guidelines for managing cattle grazing in riparian areas to protect water quality: Review of research and best management practices policy. *J.C. Mosley, P.S. Cook, A.J. Griffis, and J. O'Laughlin* (December 1997).

No. 16. History and analysis of federally administered land in Idaho. *J. O'Laughlin, W.R. Hundrup, and P.S. Cook* (June 1998).

No. 17. Public opinion of water pollution control funding sources in Idaho. *J. O'Laughlin and K. McGuire* (December 1998).

No. 18. Toward sustainable forest management: Part I – certification programs. *P.S. Cook and J. O'Laughlin* (December 1999).

No. 19. Toward sustainable forest management: Part II – the role and effects of timber harvesting in Idaho. *P.S. Cook and J.O'Laughlin* (December 2000).

No. 20. Taxing forest property: Analysis of alternative methods and impacts in Idaho. *P.S. Cook and J. O'Laughlin* (November 2001).

No. 21 Endowment fund reform and Idaho's state lands: Evaluating financial performance of forest and rangeland assets. *J. O'Laughlin and P.S. Cook* (December 2001).

No. 22. Forest resource-based economic development in Idaho: Analysis of concepts, resource management policies, and community effects. *C. Harris, P.S. Cook, and J. O'Laughlin* (May 2003).

No. 23. Comparison of two forest certification systems and Idaho legal requirements. *P.S. Cook and J. O'Laughlin* (December 2003).

No. 24. Forest fire smoke management policy: Can prescribed fire reduce subsequent wildland fire emissions? *P.S. Cook and J. O'Laughlin* (November 2004).

No. 25. Delisting endangered species: Process analysis and Idaho case studies. *M. McClure, P.S. Cook, and J. O'Laughlin* (October 2005).

Idaho's Forest Products Business Sector: Contributions, Challenges, and Opportunities

by

Philip S. Cook,[1]
and
Jay O'Laughlin[2]

Report No. 26
Policy Analysis Group
College of Natural Resources
University of Idaho

August 2006

---

[1] Philip S. Cook is a Research Associate with the College of Natural Resources Policy Analysis Group, University of Idaho, Moscow.

[2] Jay O'Laughlin is Director of the College of Natural Resources Policy Analysis Group, and Professor in the Department of Forest Resources, University of Idaho, Moscow.

About the Policy Analysis Group (PAG)

Role and Mission. The Idaho Legislature created the Policy Analysis Group (or "PAG") in 1989 as a way for the University of Idaho to provide timely, scientific and objective data and analysis, and analytical and information services, on resource and land use questions of general interest to the people of Idaho. The PAG is a unit of the College of Natural Resources Experiment Station, administered by Steven B. Daley Laursen, Director, and Dean, College of Natural Resources.

PAG Reports. This is the twenty-sixth report of the Policy Analysis Group (see inside cover). The PAG is required by law to report the findings of all its work, whether tentative or conclusive, and make them freely available. PAG reports are primarily policy education documents, as one would expect from a state university program funded by legislative appropriation. The PAG identifies and analyzes scientific and institutional problems associated with natural resource policy issues. In keeping with the PAG's mandate, several alternative policy options are developed and their potential benefits and detrimental effects are analyzed. As an operational policy the PAG does not recommend an alternative.

Advisory Committee. A standing Advisory Committee (see inside cover) has specific functions assigned by the PAG's enabling legislation. The committee's main charge is to review current issues and suggest topics for analysis. Based on those suggestions, the dean of the College of Natural Resources works closely with the PAG director to design analysis projects. The Advisory Committee has a responsibility to suggest the appropriate focus of the analysis. This is done iteratively, until an outline for the project is mutually agreed upon by the committee and the PAG. The outline is usually organized as a series of focus questions, and the PAG's analytical tasks are to develop replies to the questions. The PAG uses the resources of the university and other public and private organizations as needed. When the PAG becomes active on a project, the Advisory Committee receives periodic oral progress reports. This process defines the scope of PAG report content and provides freedom for the PAG to conduct unbiased analysis.

Technical Review. Peer review of PAG work is absolutely essential for ensuring not only technical accuracy but also impartiality and fairness. A technical advisory committee and technical reviewers are selected separately for each project by the dean and PAG director, sometimes upon recommendation of the Advisory Committee, to ensure that a wide range of expertise is reflected in the design and execution of PAG reports, and that no point of view is favored. Report review criteria used by the National Research Council of the National Academy of Sciences are the guidelines furnished to PAG reviewers.

Additional Information. If you would like additional information, please contact Jay O'Laughlin, PAG Director, at any of the following addresses:

Policy Analysis Group
College of Natural Resources
University of Idaho
Moscow, ID 83844-1134

voice: 208-885-5776
FAX: 208-885-6226
E-mail: pag@uidaho.edu
World Wide Web: http://www.cnr.uidaho.edu/pag

ACKNOWLEDGMENTS

The authors thank the following individuals for their assistance providing information for this report.

Professor Charles E. Keegan III, Bureau of Business and Economic Research, University of Montana
Dr. Garth Taylor, Department of Agricultural Economics and Rural Sociology, University of Idaho
Rod Brevig, Idaho State Tax Commission
Gerald Fleischman, Energy Division, Idaho Department of Water Resources
Thale Dillon, Research Associate, Bureau of Business and Economic Research, University of Montana
Jason Brandt, Research Forester, Bureau of Business and Economic Research, University of Montana

ACKNOWLEDGMENTS — TECHNICAL REVIEW

The following individuals provided comments on a review draft of this report.

Dr. Garth Taylor, Department of Agricultural Economics and Rural Sociology, University of Idaho
Dr. Steven R. Shook, Department of Forest Products, University of Idaho
Professor Charles E. Keegan III, Bureau of Business and Economic Research, University of Montana
Gerald Fleischman, Energy Division, Idaho Department of Water Resources

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

[This page left blank intentionally.]

Executive Summary

Forests, logging, and the manufacture of forest products have long been parts of Idaho's history, economy, and culture. Although Idaho has diversified in many ways in the last several decades, forests remain important to the people of Idaho for environmental, economic, and social reasons. Forests provide the basis for many businesses and jobs in the state, as well as contributing to the general welfare of all Idahoans. This report identifies the current contributions of the forest products business sector to Idaho, the challenges and opportunities the sector faces, and public policy opportunities that might enhance the sector's contributions in the future.

Idaho's forests

Timberlands—forest lands that are producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation—account for 16.8 million acres of the 53.0 million acres in Idaho (31.8%). There are another 3.7 million acres of forests reserved as wilderness, and 1.1 million acres of low-productivity woodlands. Idaho's timberlands contain almost 40.0 billion cubic feet of timber growing stock, and almost 75% of these timberlands are in federal ownership.

In 2005, the timber harvest level in Idaho was 1.16 billion board feet, after averaging about 1.60 billion board feet from the mid-1980s to the early 1990s. The reduction in timber harvest levels is due primarily to a decrease in harvests from federal lands within the National Forest System.

Economic contributions

The forests products business sector provides many economic benefits to the state of Idaho and its communities.

Production. Lumber production in Idaho in 2005 was approximately two billion board feet, with almost all production taking place in the northern part of the state. In 2004, Idaho ranked 8th among all states in lumber production. Almost all wood harvested in Idaho is processed in Idaho, and 86% of primary wood products are exported out of state.

Sales value. The inflation-adjusted value of sales of primary wood and paper products in Idaho has fluctuated between $1.5 billion and $2 billion since 1985. In 2005, it was $2 billion.

Jobs. The forest products industry in Idaho employed about 15,100 workers in 2005, roughly the same as in 2004. Everything else being equal, one forest products industry worker was employed for each 76,800 board feet of timber harvested; i.e., there were 13 workers for each million board feet harvested in 2005.

In 2004, wages and salaries of workers in the forest products industry in Idaho totaled $422 million. The forest products industry is a high-wage sector, providing an average wage or salary per job of $32,355, compared to $22,587 for all Idaho industries. In 2000, 4.6% of total labor income in Idaho came directly from the forest products industry. By this measure, only two other states, Maine and Oregon, have a higher level of dependence on the industry.

Multipliers and total impacts. One way to measure the total contribution of a business sector to the economy is through its linkages to other business sectors. Many business sectors exist to serve other sectors; in effect, these industries are indirectly employed by the others. Multipliers are measures of the interdependence of linkages within an economy.

Based on 2002 data, the output multiplier for Idaho's forest products business sector was 2.01. This means each dollar of sales by the forest products business sector generated another $1.01 in sales in other sectors of Idaho's economy. The labor income multiplier for Idaho's forest products business sector was 2.44, which means that each dollar of labor income paid to workers in the forest products business sector created $1.44 of additional income in other sectors of Idaho's economy. The employment multiplier for Idaho's forest products business sector was 3.09. This means that every 100 jobs in the forest products business sector supports an additional 209 jobs in other sectors of Idaho's economy. Analysis of the 1985-1998 period in Idaho indicates that industries with the highest multipliers did not grow the fastest, but they generated the largest ripple effects on Idaho's economy.

Property taxes. Property taxes are used by local taxing districts (e.g., municipalities, cities, counties, libraries, highways) to provide public services. Timber property in Idaho had a total market value of $850 million in 2004, or 1.1% of the $78 billion total for all property in Idaho. Timberland owners in 2004 paid $10.6 million in property taxes, or about 0.9% of all property taxes collected in the state.

State endowment lands. The Idaho Department of Lands (IDL) manages almost one million acres of timberland as part of the "endowment lands" granted to the state from the federal public domain at statehood. According to the Idaho Constitution, these lands are managed to provide "maximum long term financial return" to the trust beneficiaries,

which are primarily the public schools and also include eight other public institutions. Between 2002 and 2004, timber harvest revenues from state endowment lands averaged almost $50 million and accounted for 85% of all revenues from Idaho's endowment lands.

Community dependence. Reporting the economic contributions of the forest business sector at the state or county level can sometimes obscure the magnitude of contributions at the community level. The most recent assessment of the economic contributions of the forest products business sector at the community level comes from data collected for the Interior Columbia Basin Ecosystem Management Project (ICBEMP) in the mid-1990s. Of the 211 communities of all sizes identified in ICBEMP, 32 were dependent on the wood products sector for more than 10% of employment, a level economists considered to be "highly dependent."

Non-market contributions

Forests are valued for many reasons in addition to the wood and paper products they provide. The non-market values of forests can be categorized into five sets of values: recreation, ecosystem services, proximate land value, social and community values, and passive values. Non-market valuation techniques, such as the travel cost method, contingent valuation, and hedonic pricing, are used to measure these values and their contributions to a state's economy. Detailed information and assessment of the non-market contributions of forests to Idaho are not available. Most such research focuses on either a much broader or more detailed geographic scale. There has not been a comprehensive study at the state level attempting to value all non-market resources associated with forests.

Challenges

The forest products business sector in Idaho faces numerous challenges. The availability of raw material (logs) is the major challenge for many Idaho forest products businesses. Timber is the single largest cost item for forest product manufacturers and has become a competitive disadvantage for western U.S. producers, mainly due to constraints created by public policy.

Markets for wood and paper are international. Globalization and the rise of low-cost producers overseas pose challenges for domestic manufacturers. In recent years, high energy and transportation costs and low finished product prices have created especially challenging market conditions. Finding enough adequately trained workers is also becoming more difficult. Other challenges include: environmental regulation, trade policies, tax policies, market access, and building materials that compete with wood.

Opportunities

As worldwide population and income grow, demand and markets for forest products expand. The Idaho forest products business sector has the opportunity to help meet the worldwide demand, but must compete with manufacturers of forest products in other U.S. regions as well as other countries.

Policies addressing raw material availability and utilization. Several recent policy changes at the federal and state levels may help to address the challenge of raw material availability in Idaho. The Healthy Forests Initiative is a package of administrative and legislative changes undertaken by the Bush administration to implement the National Fire Plan by reducing the risks of wildfire on federal lands. Fuels reduction is a large part of the strategy on the ground. Woody materials removed during hazardous fuels reduction and landscape restoration activities may be utilized in some manufactured products (e.g., lumber, engineered wood products, paper and pulp, furniture), bio-energy for electric power and heat, bio-based products (e.g., plastics), and bio-fuels (ethanol and bio-diesel).

Much of the material being removed from forests as a result of fire hazard reduction projects is small-diameter timber and other woody biomass not traditionally used by the forest products industry for primary solid wood products such as lumber. Numerous federal laws and policies are spurring research, development, and investment in projects to find new ways to use these raw materials. Several states have policies related to biomass utilization including ethanol production incentives, renewable energy portfolio standards, grants and loans, tax incentives, industrial recruitment incentives, rebate programs, green power purchasing/aggregation policies, utility green pricing programs, and outreach programs. In June 2005, the U.S. Forest Service introduced a national strategy for improving woody biomass utilization through its programs and activities. The transition to smaller-diameter and different woody raw materials is not without challenges, however. Investment of capital in new plants to handle small-diameter timber is risky, especially without an assured long-term supply of raw material.

At the state level, the Idaho Department of Lands has determined that the sustainable harvest

levels from state endowment lands can be increased to 30 million board feet per year. This increase of approximately 15% from previous levels is being phased in beginning in FY 2006.

Economic development. In recent years, numerous countries, regions of the U.S., and states have aggressively pursued business cluster development strategies to better understand their local economies and achieve competitive advantage in the market. An industry cluster is a geographic concentration of similar and/or related firms that together provide competitive advantages for members of the cluster and the area economy. Pursuit of such strategies that promote forest products clusters may be good for Idaho.

Expanding the view of the forest sector beyond those activities that are most directly dependent on forests may be useful in analyzing and developing a forest-based cluster. Opportunities to expand the forest cluster could occur by developing relationships with other potential partners including: agribusiness—as in packaging; recycling—for newsprint and paperboard; transportation—for supply chain management; architecture and engineering—by specifying wood as a preferred environmentally and energy efficient alternative to other non-renewable sources of building materials; high-tech—with potential applications ranging from light-touch harvest equipment to more sophisticated scanning and milling technology to recover higher value from logs.

Innovation and entrepreneurship in value-added secondary processing of forest products is taking place in many rural areas. Value-added producers that are export-oriented increase the economic impact multiplier effect. Building public-private partnerships, organizing regionally, coordinating related and complementary programs, getting commitment from public leaders, and targeting sectors and services are key elements to shaping effective value-added wood products initiatives. Services that might be offered via public institutions or public-private partnerships include: training and education, marketing and export assistance, technological assistance, research, and capital formation assistance.

***Programs in other states*.** Opportunities for the expansion of the forest products business sector that are featured in other states may provide ideas appropriate to Idaho. For example, the state of Washington has a Forest Products Revolving Loan Fund that helps finance projects that implement value-added production processes. The Oregon State University College of Forestry and the Oregon State University Extension Service have created the Oregon Wood Innovation Center, whose mission is to work with private forest products manufacturers to improve the competitiveness of Oregon's forest sector, help the state preserve jobs, and better adapt to a challenging global environment. Wisconsin participates in and helps finance Forward Wisconsin, a public-private state marketing and business recruitment organization whose mission is to attract new businesses, jobs, and increased economic activity to the state. The Kentucky Wood Products Competitiveness Corporation, a public-private partnership promotes the development of the state's secondary wood products industries. Pennsylvania and Maine are also among the states with programs targeted at developing the forest products business sector.

Idaho programs. Idaho currently administers or participates in several programs in which increased and/or more focused involvement by and on the forest products business sector may result in further strides toward the sector's potential. For example, the Idaho Forest Products Commission's education and information mission could be expanded, or another organization created, with a specific mission to assist in the economic development of the forest products business sector. The Resource Conservation and Development (RC&D) program, administered by the U.S. Department of Agriculture's Natural Resources Conservation Service, supports projects in Idaho geared towards expanding the potential of the forest products business sector. The Idaho Rural Partnership (IRP) helps rural communities develop and promote private/public partnerships and facilitates rural initiatives in Idaho. A closer relationship with the IRP could benefit the forest products business sector.

The Energy Division of the Idaho Department of Water Resources (IDWR) is responsible for coordinating the Industry of the Future (IOF) project in Idaho. In 2001, the agency created the *Idaho Forest Industry of the Future: Strategic Technology Plan*, in cooperation with the Intermountain Forest Association, the University of Idaho College of Natural Resources, the Idaho National Environmental and Engineering Laboratory, and several forest products manufacturing companies. Although the plan was completed five years ago, it has not been actively pursued to date. Opportunities identified by the IOF program could benefit the forest products business sector.

The Governor of Idaho established the Workforce Development Council in 1996 with a

mission to provide oversight for an integrated Idaho workforce development system and develop policies towards that end. The Workforce Development Council may provide an important opportunity for the forest products business sector to address some of its workforce issues.

The Inland Northwest Economic Adjustment Strategy (INEAS) is a partnership between the states of Washington, Oregon, Idaho and Montana, and the Affiliated Tribes of Northwest Indians. The INEAS was designed in 2004 to address economic distress in the 137 counties and among 23 tribes across the four northwestern states by strategically supporting regional business clusters, entrepreneurial development, technology commercialization, and community sustainability. The forest products business sector in Idaho potentially could benefit from implementation of the INEAS, if Congress were to fund the program.

The Inland-Northwest Forest Products Research Consortium is a cooperative effort between the Forest Products Department at the University of Idaho, the Bureau of Business and Economic Research at the University of Montana, and the Wood Materials and Engineering Laboratory at Washington State University. The consortium investigates forest products and utilization problems important to the Inland Northwest, particularly those related to small-diameter timber. Such cooperative efforts with educational institutions can benefit the forest products business sector.

Conclusions

Idaho's forest products business sector provides important economic benefits to the state. It is not a high-growth sector, but it is highly linked to other sectors of the economy as demonstrated by its multipliers, which are indicators of interindustry relationships. Development strategies that focus entirely on high-growth sectors miss opportunities for increased contributions from the forest products sector and other industries linked to it.

Firms need access to information and specialized assistance to produce and manufacture high value wood products more efficiently, have a greater production capacity, employ a highly skilled workforce, and sell products in foreign and domestic markets. A needs assessment survey is a good place to start. Idaho is currently without a comprehensive assessment of the needs of the forest products business sector.

Cluster-based strategies are a current, popular model for economic development programs. Idaho may want to explore such strategies, as many other states have already done. With emphasis on innovation and value-added production, the forest products business sector in Idaho can grow despite on-going raw material availability issues.

Idaho's state government does not have a centralized institution that focuses specifically on development of the forest products business sector. Several other states have chosen to go that route. A public-private partnership with the mission of helping the forest products business sector reach its potential could help.

Chapter 1. Introduction

Forests, logging, and the manufacture of forest products have long been parts of Idaho's history, economy, and culture. Although Idaho has diversified in many ways in the last several decades, forests remain important to the people of Idaho for environmental, economic, and social reasons. Forests provide the basis for many businesses and jobs in the state, as well as contributing to the general welfare of all Idahoans.

This report identifies the current contributions of the forest products business sector to Idaho, the challenges and opportunities the sector faces, and public policy opportunities that might enhance the sector's contributions in the future. We recognize that Idaho's forests provide many other benefits besides those tied to business, but the business sector is the focus of this report. We concentrate on traditional forest products, such as lumber and paper, but recognize that forests provide numerous other products that are inputs to a diverse set of businesses.

Many U.S. states are targeting their forest products sector to further economic development and expansion, particularly in rural areas (Vlosky and Chance 1997). In the past few years, several states have produced reports with a purpose similar to this one, including Oregon (Hovee & Co. 2004), Florida (Hodges et al. 2005), California (Laaksonen-Craig et al. 2005), Alabama (Alabama Forestry Commission 2004), Georgia (Riall 2003), Maine (INRS 2005), and North Carolina (NCIF & NCFA 2003). Several of the assessments from other states collected original data. We use primarily secondary sources of data and results from other studies that are relevant to Idaho.

As a starting point for understanding the contributions and potential of Idaho's forest products business sector, we take a brief look at the forest resource and a history of its use. More in-depth analysis of Idaho's forest resource is available in other Policy Analysis Group (PAG) publications (e.g., O'Laughlin et al. 1998 [PAG #16, Chapter 5], Cook and O'Laughlin 2000 [PAG #19, Chapter 3], Harris et al. 2002 [PAG #22, Chapter 4]).

1.1. Idaho's Forest Land

Idaho's total land area is 53.0 million acres, of which 21.6 million acres (40.9%) is forest land (Table 1-1 and Figure 1-1; Smith et al. 2004). Over 17 million acres (79.1%) of Idaho's forest land are in federal ownership (Table 1-2). The remainder is owned by private landowners (15.7%), the state of Idaho (5.1%) , and counties and municipalities (0.1%).

Most (77.7%) of Idaho's forest lands are timberlands—forest lands that are producing or

Table 1-1. Idaho's land area by land class.

	1,000 acres	*percent*
Total land area	52,960	100.0
Total forest land[1]	21,646	40.9
Timberland[2]	16,824	31.8
Reserved[3]	3,708	7.0
Other[4]	1,115	2.1
Other land	31,314	59.1

[1] Land at least 10% stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated.
[2] Forest land that is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.
[3] Forest land withdrawn from timber utilization through statute, administrative regulation, or designation without regard to productive status.
[4] Forest land other than timberland or reserved forest land.

Source: Smith et al. 2004.

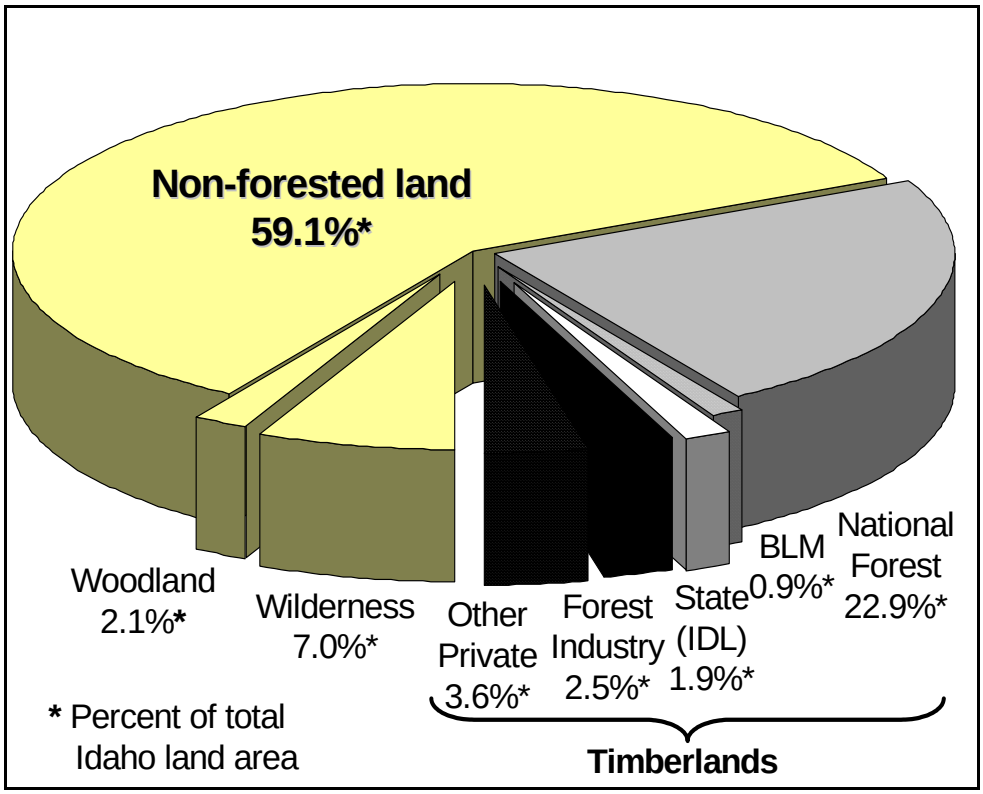

Figure 1-1. Idaho land class and ownership.

Data source: Smith et al. 2004.

Table 1-2. Idaho's forest land and timberland ownership.

	Forest land		Timberland	
	1,000 acres	*% of total*	*1,000 acres*	*% of total*
Total	21,646	100.0	16,824	100.0
Total public	18,257	84.3	13,602	80.8
Total federal	17,129	79.1	12,596	74.9
National forest	16,157	74.6	12,055	71.7
Bureau of Land Management	893	4.1	512	3.0
Other	79	0.4	29	0.2
State	1,103	5.1	980	5.8
County and municipal	25	0.1	25	0.1
Total private	3,389	15.7	3,222	19.2
Forest industry	1,284	5.9	1,284	7.6
Non-industrial private[1]	2,106	9.7	1,938	11.5

[1] Native American lands are included in the non-industrial private owner group.

Source: Smith et al. 2004.

capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation (Smith et al. 2004). Timberlands make up 31.8% of Idaho's total land area, or 16.8 million acres of which 74.9% is in federal ownership, with 19.2% in private, 5.8% in state, and 0.1% in county and municipal ownerships (Table 1-2). The forests of northern Idaho are among the most productive in the U.S. (Wilson and Van Hooser 1993).

Idaho's nonreserved timberlands contain 40.0 billion cubic feet of timber growing stock (Smith et al. 2004). Timber in national forests accounts for 30.6 billion cubic feet of growing stock (76.5%). Privately owned timberlands contain 5.9 billion cubic feet (14.8%), and other public ownerships account for 3.5 billion cubic feet (8.7%). Growing stock includes all trees with a diameter at breast height (dbh) of 4" or more. Sawtimber includes all trees greater than 11" dbh, and the ownership distribution is similar to total growing stock volume.

1.2. Idaho's Timber Harvest History

Data for timber harvests before 1947 are sketchy. Since 1947, public agencies have been collecting this data on an annual basis. Timber harvest levels in Idaho peaked in 1976 at 1.9 billion board feet (Figure 1-2). After a recession in the early 1980s that led to lower harvest levels, they rose to an average of about 1.6 billion board feet per year and remained there until the early 1990s. Since then timber harvest levels have declined to around one billion board feet per year in the 2000s (Keegan et al. 2006).

The reduction in timber harvest levels is due primarily to a decrease in harvests from federal lands within the National Forest System. The percentage of timber harvested in Idaho coming from national forests peaked in 1969 at 61% of the total harvest and has declined to about 10% in the early 2000s (Keegan et al. 2006). Some of the implications of the reduced harvest level from federal lands are discussed in Chapter 4, but it is evident from Figure 1-2 that the timber harvest level since 2001 has declined back to the level of 50 years ago.

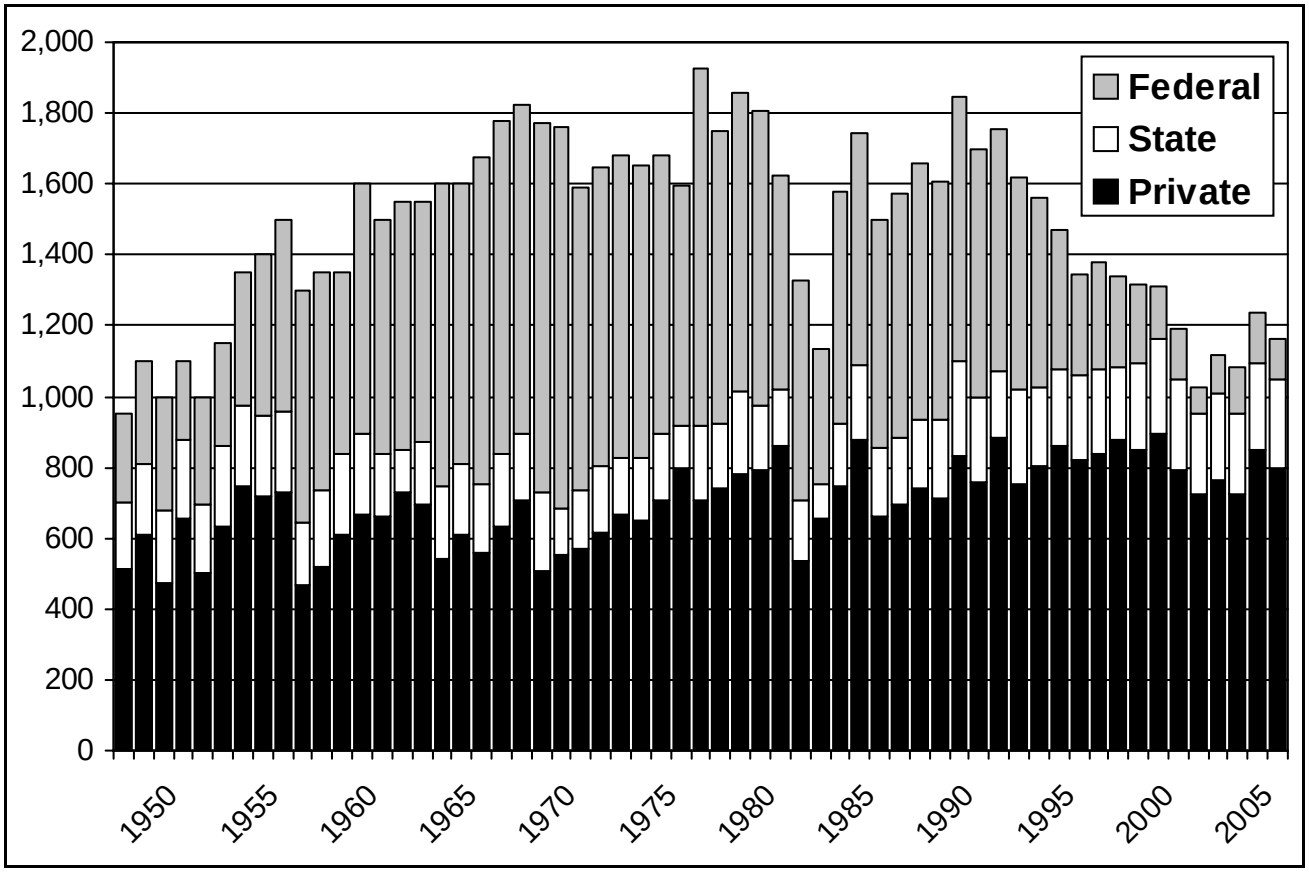

Figure 1-2. Idaho timber harvest by ownership, 1947-2005.

Source: Keegan et al. 2006.

Chapter 2. Economic Contributions

The economic contributions of the forest products business sector in Idaho can be measured in numerous ways. In this chapter, we provide information about production, jobs, wages, taxes, economic dependency, and other measures of economic contribution.

2.1. Defining the Forest Products Business Sector

An important part of assessing the contributions of the forest products business sector is identifying what businesses and economic activities are part of that sector. Defining the limits of what constitutes the forest products business sector is not a simple task because the borders of one sector overlap those of other sectors (Riall 2003). There is no widely-accepted, precise classification for what products are derived from forests or what businesses should be included in this industry or business sector (O'Laughlin and Williams 1988). Following standard industrial organization economics terminology, we use the term industry to mean not an individual business firm or enterprise, but an aggregation of such firms who are engaged in the same type of business. In this way, the terms industry and business sector are interchangeable.

In general, a definition of the forest products business sector includes all service and manufacturing activity related to the growth, harvesting, and use of forest materials that would not exist in Idaho without the presence of extensive forests or forest-based industries (Riall 2003). It includes: forestry, logging, wood products (such as dimension lumber), paper products, manufactured housing, furniture, other miscellaneous wood products, and woodworking and papermaking machinery (Riall 2003).

An Oregon study (Hovee & Co. 2004) categorizes the "forest sector" into three major activity groups plus another group covering the rest of the economy. Primary and secondary forest products plus forestry services are core group functions and reflect commonly used definitions of forest sector activity (Hovee & Co. 2004). Primary products activities involve firms engaged in primary production of goods, with logs or other direct forest harvest commodities as direct inputs to the manufacturing process. Included are sawmills, veneer/plywood plants, and pulp and paper mills. Secondary products include economic activities that typically do not involve direct milling of raw logs, but rather a refinement of a finished wood product such as millwork or manufacture of wood furniture—typically using a primary forest sector product as an input to the production process. Forestry services provide support services directly to primary and secondary firms. A diverse range of activities are encompassed, including logging contractors, timber tract operators, nursery/greenhouse, alternative forest products, fire protection, reforestation and ecological services, research, and similar activities of both private and public entities. The rest of the economy includes all business and public/non-profit sectors that are not directly involved in forestry-related activities. Although not directly a part of the forest sector, there may be important historical or prospective linkage opportunities to other sectors of the economy as part of a broader forest-centered "cluster" of business activities (Hovee & Co. 2004).

Because we rely on secondary sources for information about the forest products business sector in this report, discrepancies arise between estimates from different sources because the sources define the forest products business sector differently. For example, estimates of the number of jobs provided by the forest products business sector (see section 2.4 below) vary depending on whether the sources have included primary, secondary, and/or other related jobs. Many of the sources of estimates do not provide details about which jobs are included in their counts.

2.2. Production

Lumber is one of the principal forest products that is produced from timber. In 2004, Idaho ranked 8th among all states in lumber production (WWPA 2005). In 2005, lumber production in Idaho was approximately 2.0 billion board feet (Figure 2-1, p.9), up about 2% from 1.96 billion board feet in 2004 (Keegan et al. 2006). The increase in production was due primarily to capital improvements in facilities, which resulted in increased recovery per unit of log input, and secondarily from a modest increase in timber harvested in other states and hauled to Idaho (Keegan et al. 2006).

Lumber production in Idaho has risen in recent years (Figure 2-1, p.9), despite reductions in timber harvest levels (Figure 1-2, p.7). This is due to several factors including improvement in sawmill efficiency, a higher proportion of harvested timber being made into lumber versus plywood, and importing logs from out of state (Morgan et al. 2004).

Almost all primary wood products production takes place in the northern part of the state, and

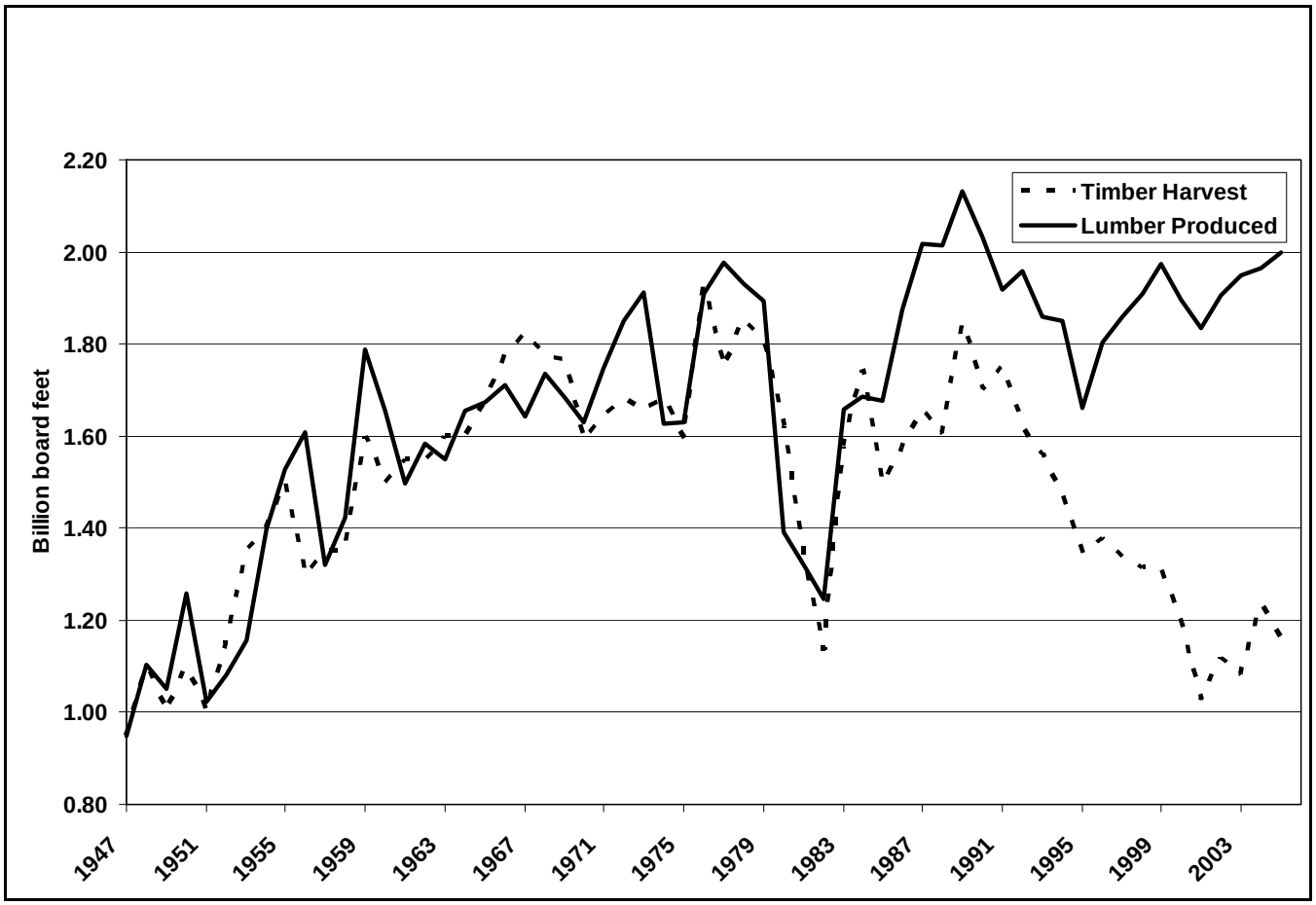

Figure 2-1. Idaho timber harvest and lumber production, 1947-2005.

Source: Keegan et al. 2006.

particularly in the northernmost counties (Table 2-1, p.10; Morgan et al. 2004). The preponderance of wood processing facilities in northern Idaho reflects the abundance of forests there (Table 2-2, p.11). Recently the types of primary wood processing facilities operating in Idaho have changed (Table 2-3, p.12), as there are fewer sawmills and more residue-related product mills as well as facilities processing house logs (i.e., raw logs for "log cabin" style homes).

Almost all timber harvested in Idaho is processed in Idaho (Table 2-4, p.12), and most (86%) of the primary wood products produced are exported out of state (Table 2-5, p.13). States in the Rocky Mountains and other western regions are the largest markets for Idaho's wood products exports.

2.3 Sales value

The inflation-adjusted value of sales of primary wood and paper products in Idaho has fluctuated between $1.5 billion and $2 billion since 1985 (Figure 2-2, p.14). In 2005, it was $2 billion, approximately the same as 2004 sales (Keegan et al. 2006). The proportion of total sales value represented by lumber has decreased somewhat over time (Figure 2-2, p.14). The change in sales value over time of Idaho's primary forest products (Table 2-6, p.14) reflects the change in the types of products being produced, with less value in lumber products and more in residue-related products and house logs.

2.4. Jobs

As one would expect from the declining timber harvests and increasing investment in mill technology trends described above, the recent trend in employment has been declining (Figure 2-3, p.15). The number of jobs provided by the forest products business sector varies based on which jobs are included in the estimates. The forest products business sector can include a wide range of workers from foresters and loggers to chief executive officers of large corporations, administrative assistants, and grounds keepers at production facilities. In 2005, the

Table 2-1. Idaho lumber production by geographic area, 1979, 1985, 1990, 1995, and 2001.

County group	1979	1985	1990	1995	2001
	thousand board feet (MBF), lumber tally				
Bonner and Boundary	462,481	358,064	552,426	408,988	661,509
Benewah, Kootenai, and Shoshone	467,965	490,866	629,129	613,014	563,482
Latah, Lewis, and Nez Perce	360,847	198,633	262,148	231,610	274,990
Clearwater and Idaho	248,917	228,792	255,336	209,176	156,298
NORTHERN IDAHO	1,540,210	1,276,355	1,699,039	1,444,788	1,656,279
SOUTHERN IDAHO	391,791	389,020	355,511	228,571	102,471
IDAHO TOTAL	1,932,001	1,665,375	2,054,550	1,673,359	1,758,750

Source: Morgan et al. 2004.

wood and paper products industry in Idaho employed about 15,100 workers, roughly the same as in 2004 (Figure 2-3, p.15; Keegan et al. 2006). Everything else being equal, one forest products industry worker was employed for each 76,800 board feet of timber harvested in Idaho in 2005; i.e., there were 13 workers for each million board feet harvested.

Production occupations (e.g., team assemblers, sawing machine setters, woodworking machine setters) make up about 36% of the jobs in the wood and paper products industries (Idaho DC&L 2005). Transportation occupations (e.g., truck drivers) constitute about 16% of the jobs and woods-worker occupations (e.g., logging equipment operators, fallers) another 14%. Administrative support (7%), maintenance (7%), management (6%), construction (5%), computer (2%), engineering (2%), sales (2%), financial (2%), and other (1%) occupations account for the remaining 34% of jobs in the wood and paper products industries (Idaho DC&L 2005).

The Idaho Department of Commerce and Labor predicts that employment in the wood and paper products industries will grow about 5% during the 2000-2010 period (Idaho DC&L 2005). Construction and computer occupations within the wood and paper products industries are expected to grow the most, both at about 31%. The 5% growth predicted for the wood and paper products industries as a whole is less than the 25% growth expected for all industries in Idaho over the same period (Idaho DC&L 2005).

2.5. Wages and Salaries

In 2004, earnings by workers in Idaho's forest products industries totaled $622 million, with $422 million of that disbursed as wages and salaries (BEA 2005). The forest products industry is a high-wage sector. In Idaho, average salary per job in the forest products industry was $32,355 in 2004, substantially higher than the average for all industries in the state of $22,587 (BEA 2005). Wages are highly variable, however, depending upon occupation within the industry (Idaho DC&L 2005).

Idaho has one of the country's largest forest products industries relative to the state's economy (Morgan et al. 2004). In 2000, 4.6% of total labor income came directly from the primary and secondary wood and paper products industries. By this measure, only two other states, Maine and Oregon, have a higher level of dependence on the industry (Morgan et al. 2004).

2.6. Direct and Indirect Effects—Linkages, Multipliers, and Economic Base

A business sector's contribution to the economy can be measured through "direct" or "total" economic measures. Sales, jobs, and payroll are measures of the "size" of a business. However, size measures are only one dimension of a business sector's contribution to an economy. Many business sectors exist to serve other sectors; in effect, these industries are indirectly employed by other industrial sectors. The influence one business sector exerts over other sectors is measured by "linkages" (Peralta 2001). Two types of linkages exist: backward linkages are stimuli of expansion imparted from one business sector to its input-supplier sectors; forward linkages are stimuli of expansion imparted from one business sector to its output-user sectors (Peralta 2001).

"Multipliers" are measures of interdependence of linkages within an economy. Multipliers are estimated from input-output models that are

Table 2-2. Number of active Idaho primary wood products facilities by county, 2001.

County	Sawmills	Veneer/ plywood	Posts, poles, and other roundwood products	House logs	Cedar	Residue-related products[1]	Total
Ada			1	1		1	3
Adams	1					1	2
Bear Lake	1						1
Benewah	4	1	1		4	1	11
Blaine				1			1
Boise			1				1
Bonner	5	1	5	4		3	18
Bonneville			1				1
Boundary	3			2	1		6
Canyon			1			1	2
Clearwater	2			1	2		5
Custer	1			1			2
Fremont	1			1			2
Gem	1	1	1			1	4
Gooding			1	1			2
Idaho	4		2	1			7
Jefferson				1			1
Kootenai	6	1	4	2		2	15
Latah	3				1		4
Lemhi			1	1			2
Lewis	1				2	1	4
Madison						1	1
Nez Perce	1					5	6
Payette				1			1
Shoshone	1						1
Teton			2	2			4
Twin Falls			1				1
Valley							1
TOTAL	35	4	22	21	10	17	109

[1]Residue-related products include a particleboard plant, roundwood/chip conversion facilities, pulp and paper facilities, decorative bark plants, and biomass/energy facilities.

Source: Morgan et al. 2004.

Table 2-3. Number of active Idaho primary wood products facilities in 1979, 1985, 1990, 1995, and 2001.

Year	Sawmills	Veneer/ plywood	Posts, poles, and other roundwood products	House logs	Cedar	Residue-related products[1]	Total
1979	133	8	35	15	44	7	242
1985	90	7	26	20	25	6	174
1990	80	6	27	22	26	11	172
1995	62	6	32	32	15	15	162
2001	35	4	22	21	10	17	109

[1]Residue-related products include a particleboard plant, roundwood/chip conversion facilities, pulp and paper facilities, decorative bark plants, and biomass/energy facilities.

Source: Morgan et al. 2004.

developed by researchers to estimate changes in production attributable to all business sectors of the economy based upon changes in production for a single business sector. Output and employment multipliers measure total output produced and total employment created in the economy associated with production output and associated employment in a given business sector, which are a function of demand for that product from other sectors (Peralta 2001).

The "economic base" concept is derived from input-output models and is consistent with the theoretical framework underlying multipliers and backward linkage. The economic base concept identifies two types of economic activity: "basic" activities that produce goods and services to be exported from the region being modeled, and "non-basic activities" that produce goods and services to be consumed within the region as well as to support the basic activities. In the economic base concept, exports from the region are the force that drives regional production, and the income generated by basic economic activity (i.e., the "economic base") is generally viewed as the driver of the local economy (Peralta 2001).

In 2000, Idaho's wood and paper products industries provided 8% of basic industry employment and 12% of basic industry labor income

Table 2-4. Idaho's intra-state and inter-state timber flows, 2001.

	Region of Harvest			
Percentage of total harvest processed in:	Northern Idaho	Southwestern Idaho	Southeastern Idaho	IDAHO TOTAL
county of harvest	33%	19%	11%	32%
adjacent county	51%	63%	35%	52%
nonadjacent county	16%	18%	54%	17%
northern Idaho	99%	13%	0%	94%
southwestern Idaho	1%	86%	3%	5%
southeastern Idaho	0%	0%	97%	1%
Idaho	95%	46%	77%	90%
out-of-state	5%	54%	23%	10%

Source: Morgan et al. 2004.

Table 2-5. Destination and percentage of total sales value of Idaho's 2001 primary wood product sales.[1]

Product	Idaho	Rocky Mountain[2]	Far West[3]	North-Central[4]	Northeast[5]	South[6]	Other countries	Unknown
Lumber, timber, other sawn products	15%	25%	25%	19%	10%	6%	0%	0%
Plywood and veneer	2%	7%	16%	32%	20%	13%	11%	0%
Post, poles, rails, and other roundwood products	27%	8%	29%	12%	5%	0%	19%	0%
House logs and log homes	22%	39%	22%	8%	3%	3%	3%	0%
Cedar products	11%	10%	13%	22%	2%	41%	0%	0%
2001 ALL PRODUCTS TOTAL	14%	23%	24%	20%	10%	7%	2%	0%
1995 All Products Total	19%	22%	18%	22%	10%	8%	1%	0%
1990 All Products Total	13%	13%	19%	24%	16%	11%	2%	2%
1985 All Products Total	11%	18%	14%	21%	13%	12%	0%	11%
1979 All Products Total	11%	20%	9%	25%	10%	10%	1%	13%

[1]Does not include mill residue sales or sales by the residue-utilizing sector.
[2]Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico
[3]Washington, Oregon, California, Alaska, Hawaii
[4]North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, Ohio
[5]Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania
[6]Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Tennessee, Kentucky, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, West Virginia, Maryland, Delaware, Washington, D.C.

Source: Morgan et al. 2004.

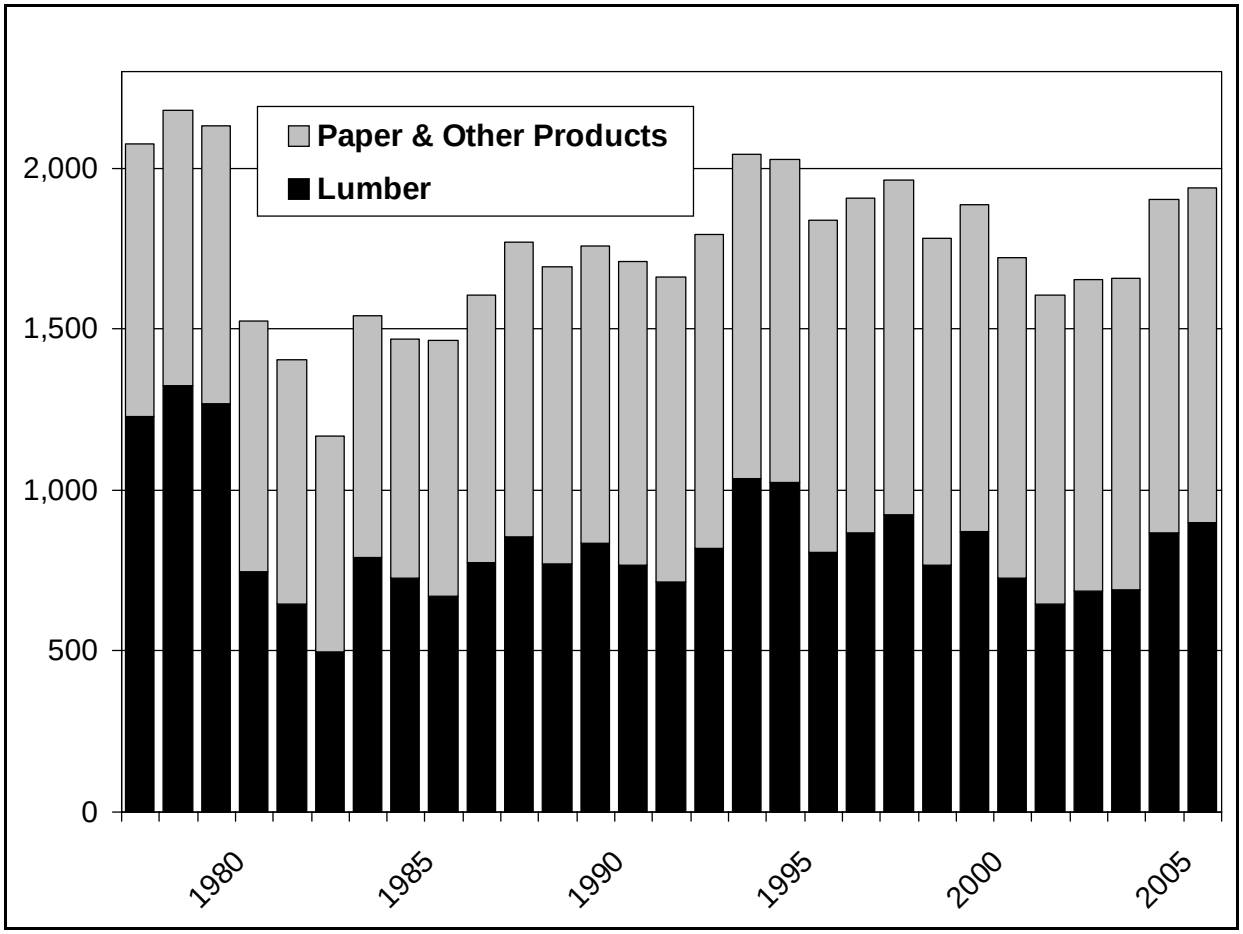

Figure 2-2. Sales value of Idaho's primary wood products, 1977-2005 (in constant 2005 dollars).

Source: Keegan et al. 2006.

Table 2-6. Sales value of Idaho's primary wood products, by product type, 1979, 1985, 1990, 1995, and 2001 (in constant 2001 dollars).

Product	1979	1985	1990	1995	2001
			Million 2001 dollars		
Lumber, timbers, other sawn products	1,153.9	648.1	703.5	800.0	687.6
Plywood and veneer	195.6	122.6	136.2	192.7	69.9
Cedar products	30.0	12.2	18.3	15.7	30.4
House logs and log homes	17.9	5.0	13.2	23.4	25.5
Posts, poles, and other roundwood products	37.8	19.1	34.2	29.3	22.2
Residue-related products[1]	556.6	585.5	722.3	772.1	812.6
ALL PRODUCTS	1,991.7	1,392.6	1,627.8	1,833.1	1,648.1

[1]Residue-related products include particleboard, chips, pulp and paper products, bioenergy products, decorative bark, and mill residues sold within and outside the state.

Source: Morgan et al. 2004.

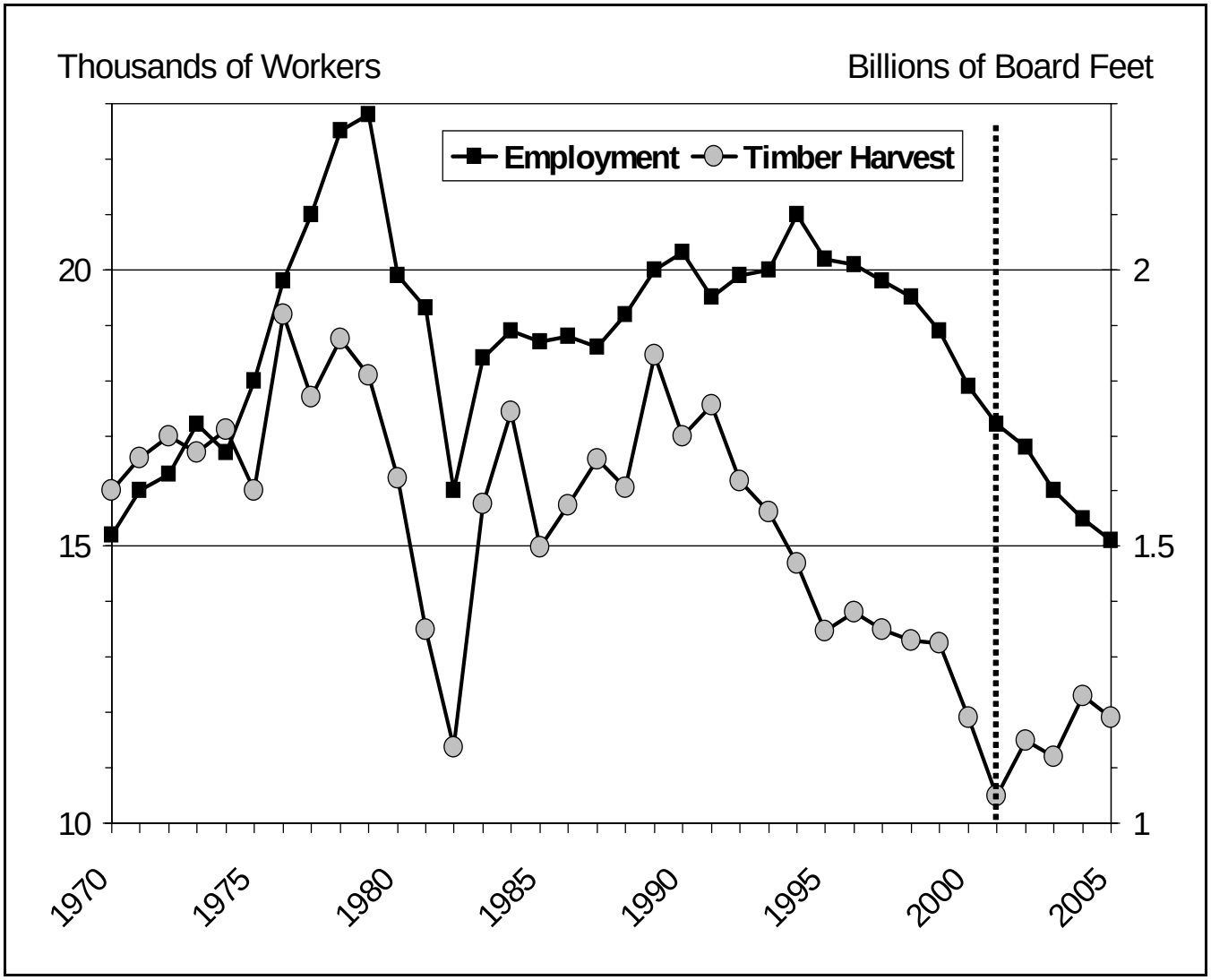

Figure 2-3. Employment in Idaho's forest products industry and Idaho timber harvest level, 1970-2005.

Note: The dotted line at 2001 indicates a change from the Standard Industrial Classification (SIC) system to the North American Industry Classification System (NAICS), which has made it problematic to provide consistent and continuous timber series data for employment. Numbers for years prior to 2001 are based on the old SIC system, while the more recent figures are based on NAICS.

Source: Keegan et al. 2005a.

statewide (Morgan et al. 2004). In northern Idaho, the wood and paper products industries provided 27% of basic industry labor income, the highest percentage of any industry (Morgan et al. 2004).

The economic base concept hypothesizes a relationship between basic and non-basic activity. As a result, changes in basic sector activity can be directly linked to changes in non-basic activity through an impact multiplier. For every single dollar of income earned in the basic sectors, models developed using the economic base concept assume an additional amount of dollars (call it "X") is earned in the non-basic sectors. The "X" factor is called a "multiplier" and can be used to predict changes in local economic activity based on predicted changes in basic economic activity (Robertson 2003). In an input-output model all business sectors, basic and non-basic, purchase and sell to each other and to the final demand sectors (Peralta 2001).

We used an input-output model called IMPLAN (MIG 2005) to compute multipliers for sales, labor income, and employment generated by Idaho's forest products business sector in 2002. The output

multiplier for Idaho's forest products business sector was 2.01. This means each dollar of sales by the forest products business sector generated another $1.01 in sales in other sectors of Idaho's economy. The labor income multiplier was 2.44, which means that each dollar of labor income paid to workers in the forest products business sector created $1.44 of additional income in other sectors of Idaho's economy. The employment multiplier for Idaho's forest products business sector was 3.09. This means that every 100 jobs in the forest products business sector supports an additional 209 jobs in other sectors of Idaho's economy.

Analysis by Peralta (2001) shows that the leading Idaho industries identified with the highest multipliers and backward and forward linkages were not the fastest growing sectors during the 1985-1998 period. In fact the wood products industry contracted during that period. However, the leading industries of the 1980s, including forest products, were in the late 1990s the industries that generated the largest ripple effects on Idaho's economy (Peralta 2001).

2.7. Property Taxes

Property taxes are used by local taxing districts (e.g., municipalities, cities, counties, libraries, highways) to provide public services. All property—real, personal, and operating—within the state of Idaho, unless specifically exempted, is subject to property taxation (Idaho Code §§ 63-203, 63-601). However, the list of types of property exempted from taxation is extensive (Idaho Code § 63-602 et seq.). The public lands in federal and state ownership, which comprise more than two-thirds of Idaho's land area, are exempt from taxation.

Businesses in the forest products sector pay property taxes on a variety of types of property they own. Forest land, industrial and commercial lands, and improvements on those lands are all subject to property tax. Operating property and logging machinery, tools, and equipment are also subject to property taxation. We do not have specific information for the property tax contributions of all businesses that are part of the forest products sector; however, we outline major contributions below.

Idaho offers two tax options that provide special treatment to forest landowners who manage their property for long term timber production: the productivity tax option (Idaho Code § 63-1705), and the bare land & yield tax option (Idaho Code § 63-1706). Under the productivity tax option, the annual property taxes are paid on an assessed taxable value of the land's ability to produce timber. When timber is harvested, the forest landowner is not required to pay an additional yield tax. Under the bare land & yield tax option, annual property taxes are paid on an assessed value of the bare land only. In addition, the county collects a 3% yield tax whenever timber is harvested. (See Cook and O'Laughlin 2001 [PAG #20] for detailed analysis of the taxation systems.)

The Idaho State Tax Commission reports market values and property taxes for the "timber property" sector, which includes both land and equipment components, with most of the value (96% in 2005) represented by land (Idaho State Tax Commission 2005). Timber property in Idaho had a total market value of $850 million in 2004, which represented 1.1% of the $78 billion of market value of all property in the state of Idaho. The tax rate on timber property in 2004 was about 1.244% compared to an average of 1.460% across all types of property. Estimated taxes paid on timber property in 2004 were $10.6 million (Idaho State Tax Commission 2005).

Some counties are much more dependent on the timber property sector than others (Table 2-7, p.17). Clearwater, Benewah, and Shoshone counties are the most dependent on the timber property sector with 36.2%, 20.6%, and 18.2%, respectively, of their total property tax revenue coming from that sector.

Sector-wide timber property values decreased by 9.3% in 2004 (Idaho State Tax Commission 2005). Taxable values of timberland have been in decline since 2000 and that pattern continued as expected in 2004. The decreases reflect changing economic conditions, and, in conjunction with legislative changes to the taxable values of forest land (Idaho Code § 63-1705), are expected to continue into the future. Timber property taxes decreased 7.3%, and the timber property sector now provides 0.9% of total property taxes in the state (Idaho State Tax Commission 2005).

2.8. State Endowment Lands and the Idaho Department of Lands

The Idaho Department of Lands (IDL) manages almost 2.5 million acres of "endowment lands," granted to the state from the federal public domain at statehood (see O'Laughlin 1990 [PAG #1]). The Idaho Constitution sets the IDL's management goal for these lands as providing "maximum long term financial return" to the trust beneficiaries, which are primarily the public schools plus eight other public institutions. The endowment lands include almost one million acres of timberland (see Table 1-2, p.6).

Timber harvests from state lands in the 2002-2004 period averaged 177,809 MBF (thousand board feet) of sawlogs, 813,858 linear feet of cedar

Table 2-7. Percent of total 2004 property taxes paid by the timber property sector in Idaho, by county.[1]

COUNTY[2]	Percent of total 2004 property taxes paid by the timber property sector[1]
Adams	6.3%
Benewah	20.6%
Boise	3.3%
Bonner	2.5%
Boundary	7.4%
Clearwater	36.2%
Freemont	0.1%
Gem	0.1%
Idaho	4.6%
Kootenai	1.0%
Latah	4.9%
Lewis	3.9%
Nez Perce	0.2%
Shoshone	18.2%
Valley	1.4%
TOTAL	0.9%

[1]The timber property sector includes land and equipment components, with most of the value represented by land.
[2]In counties not listed timber sector property taxes make up less than 0.1% of total 2004 property taxes.

Source: Idaho State Tax Commission 2005.

poles, 5,004 MBF of cedar products, and 25,161 MBF of pulp (Table 2-8, p.18). Timber revenues from state endowment lands averaged almost $50 million per year in 2002-2004, with average timber harvest-related expenses of $9.5 million (Table 2-9, p.19). Timber revenues accounted for 85% of all IDL endowment lands revenues over the same time period. (For a more complete analysis of the financial performance of Idaho's forest and range endowment lands, see O'Laughlin and Cook 2001 [PAG # 21].)

Tracing the effect of endowment land timber revenues directly to the beneficiaries, such as public schools, is somewhat difficult. Timber revenues are deposited in an earnings reserve fund—one for public schools and one for other "pooled" beneficiaries—where they are invested in financial instruments such as stocks and bonds. Each year the Idaho State Board of Land Commissioners apportions monies in the earnings reserve fund, minus administrative costs, between permanent endowment funds and income funds for the beneficiaries (Idaho Code § 57-723A). In FY 2004, $55.1 million was distributed to the income funds of the beneficiaries—with $37.7 million going to the Public School Income Fund and $17.4 million to the other "pooled" beneficiaries income fund (Idaho Endowment Fund Investment Board 2004). The income funds also include other sources of revenue. The income funds are then appropriated to the beneficiaries by the Legislature. For example, in FY 2004, the Legislature appropriated more than $965 million from the Public School Income Fund to finance public education throughout the state

Table 2-8. Timber harvest from Idaho endowment lands, FY 2002 to FY 2004.

Product	FY 2002	FY 2003	FY 2004
Sawlogs (MBF)	172,496	144,475	216,456
Cedar poles (LF)	265,650	815,225	1,360,700
Cedar products (MBF)	3,751	4,216	7,044
Pulp (MBF)	23,765	21,500	30,219

Source: IDL 2002, 2003, 2004.

(Legislative Services Office 2004). Exactly how much of that appropriation was from timber harvest revenues from endowment lands is untraceable, but no doubt timber harvest revenues accounted for some of it. It would be safe to say that in FY 2004, revenues from timber harvested on state endowment lands provided $34.5 million in net revenues for public schools (Table 2-9, p.19), or 3.5% of appropriated funds.

In addition to managing state endowment lands, the IDL participates in many other programs that promote the health and productivity of Idaho's forest lands and rural communities. These programs include: Conservation Education, Urban and Community Forestry, State Fire Assistance, Volunteer Fire Assistance, Forest Stewardship Program, Forest Legacy Program, Economic Action Programs, Fuels for Schools, Co-op Weed Management, and the Conservation Reserve Program (IDL 2005).

The IDL has approximately 250 permanent employees and 200 seasonal employees (IDL 2004). Personnel expenditures for FY 2004 were $17.7 million, with $7.9 million of that appropriated to the Forest Resources Management Division of IDL, which is responsible for managing state endowment forest lands, and enforcing timber harvesting laws and providing assistance to private forest landowners (Legislative Service Office 2005). Most of the personnel costs are salaries of IDL personnel who live and spend their earnings in communities throughout the state.

2.9 Community Dependence

Reporting the economic contributions of the forest products business sector at the state, regional, or county level can sometimes obscure the magnitude of contributions at the community level. The most recent assessment of the economic contributions of the forest products business sector at the community level comes from data collected for the Interior Columbia Basin Ecosystem Management Project (ICBEMP) in the mid-1990s. The ICBEMP identified 215 communities of all sizes in Idaho (Harris et al. 2000). Employment data were collected or developed for 211 of those communities. (Data for Dalton Gardens, Ferdinand, Onaway, and Winchester were unavailable.). Of the 211 communities, 32 were dependent on the wood products sector for more than 10% of employment, which by definition was considered to be dependent (Table 2-10, p.20; Harris et al. 2002 [PAG #22]).

Along with data on actual employment, the ICBEMP community self-assessment also gathered data on community members' *perceptions* of their town's characteristics and conditions. In Idaho, 27 communities were perceived by their residents as being dependent on wood products manufacturing, but employment data showed they were not (Table 2-11, p21). Using the 10% of employment benchmark, perceptions of the economic contributions of the forest products business sector at the community level therefore did not always conform with reality.

Table 2-9. Timber revenues and expenses for Idaho state endowment lands beneficiaries, FY 2002 to FY 2004.

	FY 2002		FY 2003		FY 2004	
Beneficiary	Revenue	Expenses	Revenue	Expenses	Revenue	Expenses
Public Schools	$35,144,800	$6,607,700	$29,267,100	$7,386,200	$41,341,500	$6,837,700
Pooled						
Agricultural College	$386,100	$128,100	$89,700	$142,100	$195,700	$132,700
Charitable Institutions	$2,029,700	$539,400	$2,567,100	$601,000	$2,442,300	$577,700
Normal School	$1,702,500	$361,600	$2,806,100	$420,300	$2,392,600	$397,800
Penitentiary	$3,142,500	$207,700	$1,394,600	$256,900	$2,094,100	$258,000
School of Science	$4,305,700	$514,100	$1,314,600	$599,000	$3,066,500	$539,100
State Hospital South	$808,800	$222,600	$1,932,700	$260,900	$2,853,800	$249,500
University of Idaho	$3,435,300	$359,900	$2,050,000	$421,300	$1,357,800	$398,100
Total pooled funds	$15,810,600	$2,333,400	$12,154,800	$2,701,500	$14,402,800	$2,552,900
Capitol	$714,800	$62,100	$274,600	$67,000	$875,200	$69,800
Total for timber asset type	$51,670,200	$9,003,200	$41,696,500	$10,154,700	$56,619,500	$9,460,400
All IDL endowment land asset types	$59,665,100	$11,509,500	$50,615,800	$13,373,700	$65,563,900	$12,978,400
Timber as % of all assets	87%	78%	82%	76%	86%	73%

Source: IDL 2002, 2003, 2004.

Table 2-10. Idaho communities with more than 10% employment in the timber and wood products sector, 1995.

Community	Percent employment in the wood products sector	Community	Percent employment in the wood products sector
Ashton	20%	Montour	63%
Athol	12%	Moyie Springs	64%
Cambridge	17%	New Meadows	37%
Deary	30%	North Powder	44%
Elk City	27%	Oldtown	16%
Emmett	14%	Orofino	12%
Fernan Lake	89%	Ovid	86%
Fruitland	18%	Payette	11%
Hayden	21%	Pierce	64%
Hope	21%	Pilot Rock	33%
Horseshoe Bend	32%	Pinehurst	12%
Huetter	100%	Plummer	20%
Juliaetta	33%	Potlatch	25%
Kamiah	22%	Priest River	29%
Kooskia	30%	St. Maries	30%
Lewiston	11%	Weippe	42%

Note: Data include all communities in Idaho except Dalton Gardens, Ferdinand, Onaway, and Winchester, for which data were unavailable.

Source: Harris et al. 2000.

Table 2-11. Idaho communities that were rated "highly" dependent[1] on the woods products manufacturing sector by citizens, but had 10% or less employment in that sector, 1995.

Community	Percent employment in the wood products sector	Community	Percent employment in the wood products sector
Bonners Ferry	10%	Kootenai	0%
Cascade	9%	Lapwai	0%
Clark Fork	10%	Leadore	0%
Clayton	0%	Osburn	8%
Craigmont	3%	Rathdrum	7%
Culdesac	0%	Riggins	3%
Donnelly	0%	Salmon	7%
Driggs	3%	Sandpoint	8%
Elk River	4%	Smelterville	0%
Grangeville	8%	Stanley	0%
Harrison	2%	Wallace	0%
Idaho City	0%	Weiser	0%
Island Park	0%	Worley	0%
Kellogg	2%		

[1]"Highly" dependent means a numerical rating of more than 4 on a 7-point scale (from 1, extremely independent, to 7, extremely dependent.

Note: Data include all communities in Idaho except Dalton Gardens, Ferdinand, Onaway, and Winchester, for which data were unavailable.

Source: Harris et al. 2000.

Chapter 3. Non-Market Contributions

Forests are valued for many reasons in addition to the wood-based products they provide. Although there are markets for some of these other "products" (e.g., guided hunting), this group of products is commonly referred to as "non-market" products or values. Detailed information and assessment of the non-market contributions of forests to Idaho are not available. Most research focuses on either a much broader or more detailed geographic scale and is not comprehensive for all non-market resources (Cook and O'Laughlin 2000 [PAG #19]). In addition, valuation techniques for these non-market contributions can be controversial. Despite our lack of information and the inability to quantify them, it is important to recognize the non-market contributions of forests to the well-being of the people of Idaho.

3.1. Defining Non-Market Contributions

Oregon researchers (Hovee & Co. 2004), have classified the non-market values of forests into five categories: recreation, ecosystem services, proximate land value, social and community values, and passive values (Table 3-1). Non-market valuation techniques, such as the travel cost method, contingent valuation, and hedonic pricing, are used to measure these values and their contributions to a state's economy (Champ et al. 2003).

3.2. Fishing, Hunting, and Wildlife Watching

Wildlife-related recreation is an example of a non-market contribution of forests for which we have some data for all of Idaho. Not all fishing, hunting, and wildlife watching can be attributed to the forest products business sector, but forests provide habitats for many types of wildlife and protect watersheds that support clean water for fish.

Every five years, the U.S. Fish and Wildlife Service and the U.S. Census Bureau survey U.S. citizens about their participation in fishing, hunting, and wildlife watching. In 2001, approximately 416,000 people participated in fishing in Idaho, 197,000 participated in hunting in Idaho, and 643,000 participated in wildlife watching (Table 3-2). They spent $311 million, $231 million, and $227 million, respectively, on equipment and trips, a total of $769 million for fishing, hunting, and wildlife watching. Expenditures by non-residents of Idaho made up 27%, 25%, and 39%, respectively, of the total expenditures (U.S. Department of Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau 2001).

Table 3-1. Non-market forest services and valuation methodologies.

Category/Function	Examples	Valuation Methodologies
Recreation	Hiking, camping, sightseeing, skiing, hunting, fishing, rock climbing. Indirect values are also noted, such as watching wildlife programs on television. Includes option value (such as the value assuring potential future recreation).	Travel cost method, contingent valuation, benefit transfer.
Ecosystem Services	Carbon sink, contributions to water and air quality, provision of fish and wildlife habitat, soil and sediment stabilization. Values are both direct (as with fish habitat) and indirect (habitat for organisms upon which fish feed).	Substitution, damage cost avoided, market price, productivity, and benefit transfer method. Potential future markets as for carbon credits, could provide measurable value data.
Proximate Land Value	Increased land values for housing, vacation, communities and resorts that are near forests, provide view of forests, etc.	Hedonic pricing method, contingent valuation.
Social and Community Values	Public facilities, social and lifestyle values, community cohesion, environmental justice. May include secondary and cumulative effects.	Funding capacity for public services, demographic and economic data analysis, social values surveys and focus groups.
Passive Values	Existence value, bequest value.	Contingent valuation, contingent choice.

Source: Hovee & Co. 2004.

Table 3-2. Fishing, hunting, and wildlife watching recreation in Idaho, 2001.

	Fishing	Hunting	Wildlife watching
Participants	416,000	197,000	643,000
Idaho residents participating	261,000	150,000	388,000
Out-of-state residents participating	165,000	47,000	255,000
Days of participation	4,070,000	2,100,000	3,610,000*
Total Expenditures	$310,872,000	$230,841,000	$227,470,000
Trip-related	$116,222,000	$83,091,000	$96,807,000
Equipment and other	$194,650,000	$147,750,000	$130,663,000
Average per participant	$718	$1,136	$354
Trips and equipment expenditures by nonresidents in Idaho	$84,894,000	$57,223,000	$88,757,000

*Includes only participation at activities away from home.

Source: U.S. Department of Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau 2001.

Chapter 4. Challenges

To identify policies that could potentially increase the contributions of the forest products business sector to Idaho, we first must identify the barriers, constraints, and challenges that the sector currently faces. A systematic, comprehensive assessment of the challenges the Idaho forest product business sector faces does not exist, so we rely primarily on anecdotal evidence, evidence from other states and the nation as a whole, and reports about manufacturing and rural areas in general.

As part of the Industry of the Future program (see section 5.4.4), the Energy Division of the Idaho Department of Water Resources, in cooperation with the Intermountain Forest Association, the University of Idaho College of Natural Resources, the Idaho National Environmental and Engineering Laboratory, and several companies in the forest products business sector created a *Idaho Forest Industry of the Future: Strategic Technology Plan* (Eklund et al. 2001). That plan identifies needs of the Idaho forest products industry (Table 4-1). Although the list emphasizes technological concerns and does not specify the relative magnitude of the various needs, it does provide some evidence of the types of challenges the Idaho forest products business sector faces.

4.1. Availability of Raw Material

As we pointed out in section 1.2, timber harvests in the state of Idaho have declined substantially during the past two decades, with the reduction primarily due to a decrease in harvests from federal lands within the National Forest System (Figure 1-2). The percentage of timber harvested in Idaho coming from national forests has declined from 61% in 1969 to 10% in 2003 (Morgan et al. 2004).

The availability of raw material has become a major challenge for many firms in the forest products business sector (Idaho Division of Financial Management 2005). A survey of contract loggers in Idaho, eastern Washington, and western Montana in 2004 found timber supply to be the highest-ranked business constraint (Allen 2006). Nearly all spokespersons for wood processing facilities surveyed in Idaho in 2005 stated that limited raw material supply was a major concern in 2005 and they expected it to continue through 2006 (Keegan et al. 2006). News accounts of wood processing facility closures suggest that raw material availability was a reason for closure in many cases (e.g., Associated Press 2003, 2004; Williams 2002, 2003). The concern about raw materials is not confined to Idaho, but is a concern of the forest products industry in general (AF&PA 1998, Hovgaard et al. 2005) and other manufacturers who rely on natural resources as raw materials for their products (Area Development Online 2005).

A 2003 survey-based study of the forest products industry in Idaho and neighboring states (Keegan et al. 2005b) indicated sawmill capacity of 265 million cubic feet in Idaho, of which 222 million cubic feet was utilized for processing, representing 84% of total mill capacity. Most of the timber processed (208 million cubic feet) exceeded 10” dbh. Mill managers indicated that they would increase production if more raw material were available, but mills rarely operate at more than 90% of capacity. About half of the managers said they would make major capital investments to expand their mills, but they stressed the need for an assured, long-term supply of timber in order to recoup investment costs. An overwhelming majority of the managers commented that before they made any investment in new small-log technology, a guaranteed, long-term supply of timber would be needed (Keegan et al. 2005b).

4.2. Other Challenges

In addition to the availability of raw material, numerous other challenges face the forest products business sector. Although we separate these into categories below, many of them are inter-related.

4.2.1. Global competitiveness. Globalization and the rise of low-cost producers and manufacturers overseas challenge the traditional rural economic base, including forest products manufacturing, in many ways (SRI International 2005, Vlosky and Chance 1997). According to the U.S. forest products business sector’s trade association, the American Forest & Paper Association (AF&PA 1998), the U.S. forest products industry faces some serious disadvantages as it tries to compete in world markets. Many of these disadvantages are caused or exacerbated by U.S. federal and state government policies that work against U.S. producers and by government policies internationally that afford a competitive advantage to producers in other countries. The AF&PA (1998) specifically identified the following issues that affect global competitiveness:

- *Raw material supply and cost.* Fiber is the number one cost for the forest products industry and has become a competitive disadvantage for U.S. producers, mainly due to constraints created by public policy.

Table 4-1. List of Idaho forest industry needs.

Sustainable forestry and alternative input resources (i.e., raw materials)

- Supply issues (i.e., availability of timber resources)
- Regulatory burdens
- Tracking and marketing of green (i.e., certified) wood-based products
- Climate (carbon sequestration), watershed and other values as marketable products (i.e., "ecosystem services")
- Productivity of intensively managed forests including attention to biodiversity
- Biotechnology
- Basic physiology
- Soil productivity
- Remote sensing
- Other fiber sources (straw, hemp)

Combustion and emissions

- Reduce, recover and reuse emissions of Volatile Organic Compounds (VOCs) Hazardous Air Pollutants (HAPs), and particulates
- Investigation of cleaner combustion technologies such as gasification, pile burning, etc.
- Better methods of fly ash management to keep it from creating particulate emissions problems

Drying

- Investigate more efficiency drying technologies such as high temperature, low-pressure, microwave and vacuum and others
- Investigate the economics of pre-drying green lumber before kiln drying and pre-drying green sawdust before combustion using waste heat from biomass combustion

Alternative wood products

- Create chemicals and liquid biofuel products from wood
- Re-evaluate the manufacturing capacity and potential use of densified wood fuel (pellets, fuel logs, briquettes) particularly in the municipal/institutional market
- Investigate potential products and market opportunities for fly ash from wood-fired boilers
- Investigate the ways urban wood waste can be used as a forest resource
- Develop classification systems for wood waste
- A waste exchange market
- Develop products made from recycled wood and plastic
- Re-examine the economics of generating electric power from wood waste

(continued)

Table 4-1. (continued).

Alternative wood products (continued)

- Develop a method to remove the colorants (tannins) from log yard waste to improve its marketability when converted to landscaping products
- More research on the economics of converting log yard debris to compost
- Investigate the benefits of microbe-enhanced compost
- Develop cost-competitive adhesives that do not have the typical "outgassing" problems associated with urea formaldehyde resins

Logging practices

- Develop alternative uses for slash material
- Develop more efficient logging systems

Process improvements

- Additional improvements in computer controlled sawing systems to extract the highest value from each log
- Automation of lumber grading
- Automated bar coding of individual boards
- Ability to track data on logs and lumber (moisture, defects, type, size, etc.) from the forest to retail delivery for green certification and other purposes
- Improved automated in-line moisture sensors that are reliable for sorting kiln lumber and other purposes.
- Better sensing of log defects
- Use of black liquor residue from paper making as fuel

Other needs and issues

- Attract and retain the most creative, intelligent and hard-working employees
- Create an Industrial Assessment Center in Idaho

Source: Eklund et al. 2001.

- *Environmental regulation.* Environmental regulation affects the industry's competitiveness because it requires capital expenditures that increase operating costs and divert capital away from other uses. The U.S. system of enforcement and compliance imposes additional cost penalties that are not borne by other international competitors.
- *Trade policies.* U.S. producers are placed at a disadvantage in international trade by trade policies, tariffs and non-tariff barriers that discourage U.S. exports while facilitating imports into U.S. domestic markets (see section 4.2.3 below).
- *Tax policies.* Taxes are a major cost item for the entire forest products industry, and the domestic tax system places U.S. companies at a disadvantage.
- *Market access*. Market access refers to the ability to sell products in any market, domestic or international, unencumbered by restrictions from government or policy-oriented non-government organizations, including regulations, legislation, policies or preferences. U.S. producers are disadvantaged in many markets compared to both foreign competitors and competing materials by a wide range of factors, including labeling and content requirements, building codes and standards, tax preferences, and disposal requirements.
- *Competing material.* U.S. forest products producers also are faced with competition in the marketplace from competing materials, such as concrete, aluminum, and steel, often

based on questionable claims of environmental superiority (AF&PA 1998).

4.2.2. Market conditions. Influences on the prosperity of the forest products business sector include the prices producers get for their products. For much of the early 2000s, lumber prices were low (Figure 4-1; Keegan et al. 2006). Nearly 90% of mill operators in Idaho see general market conditions as a major issue that will affect operation in 2006 (Keegan et al. 2006). On the cost of production side, energy and transportation costs have been identified as a concern of Idaho mill owners (Keegan et al. 2006).

4.2.3. Trade issues. A trade dispute with Canada over softwood lumber imports into the U.S. is the leading example of how trade policies create problems for the forest products business sector. The long-standing dispute resurfaced in 2001, when a five-year trade agreement with Canada expired (for details see O'Laughlin 2001 [PAG Issue Brief #1]). The dispute centers on accusations by U.S. producers that the stumpage fees Canadian forest products manufacturers pay for timber are unfair and that Canadian producers are "dumping" (selling at less than production cost) lumber onto the U.S. market. The countries have negotiated with each other, as well as asked the World Trade Organization (WTO) and North American Free Trade Agreement (NAFTA) arbitrators to aid in negotiations. On July 1, 2006, U.S. and Canadian negotiators reached agreement on ending the trade dispute that reflects a balance of concessions by both countries. No legislative action by the U.S. Congress is required to implement the agreement, but the Canadian Parliament must approve some of the provisions. Several Canadian provinces have expressed reservations about the agreement (CBC 2006, USTR 2006).

4.2.4. Workforce. Several workforce-related issues create challenges for the forest products business sector. First, as foreign competition has increased, the workplace has become more technology dependent; the labor force must become more

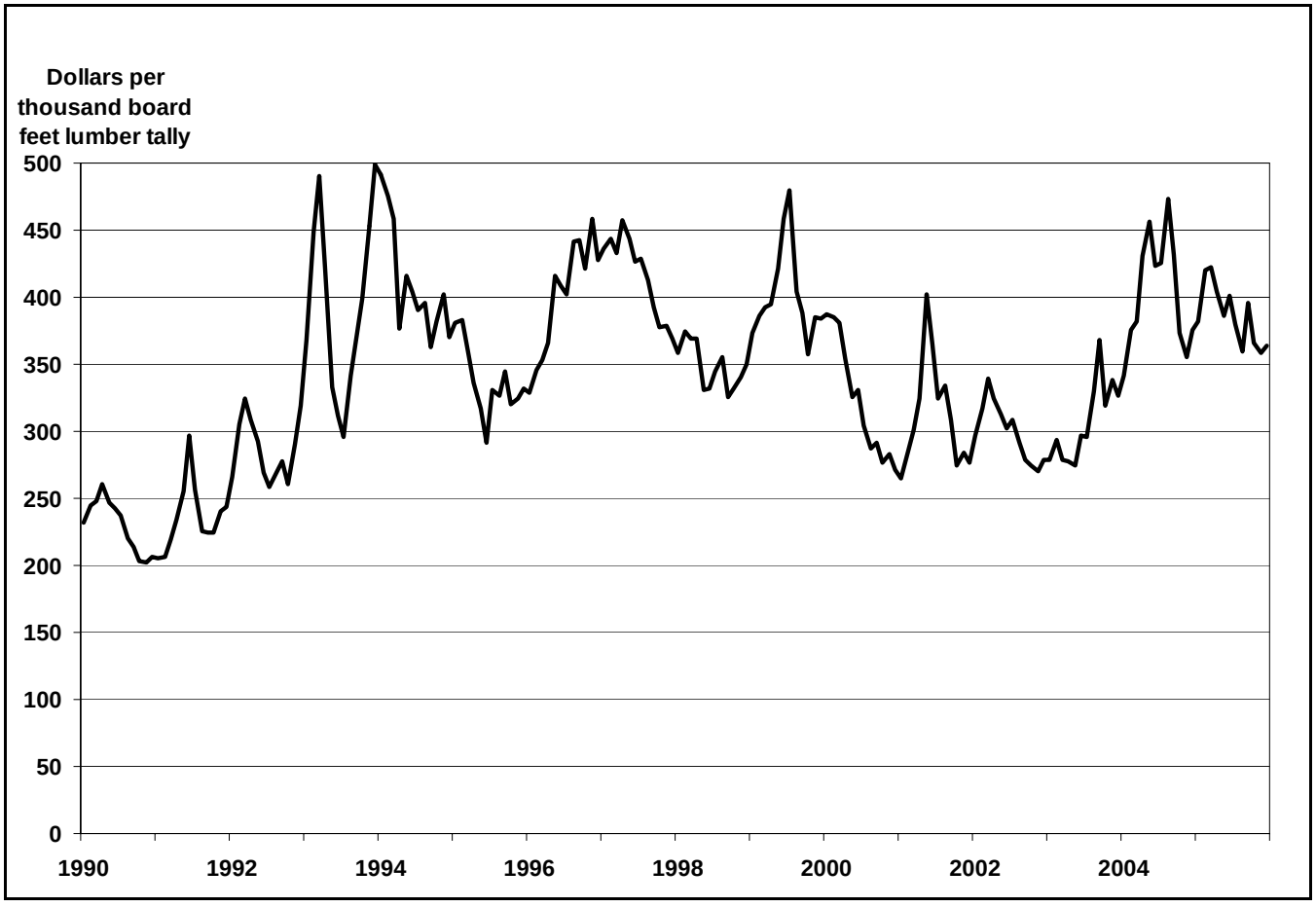

Figure 4-1. National composite lumber prices, monthly, 1990-2005 (current values, not inflation-adjusted).

Source: Random Lengths 1990-2005.

capable of assimilating new technology and more proficient in the use of advanced technology (Vlosky and Chance 1997). This emphasizes the need for a well-trained workforce. Lack of a well-trained workforce was found to be a constraint to the expansion of the forest products industry in Louisiana (Vlosky and Chance 2001). Mill managers in Idaho report the lack of available qualified personnel as a major concern for 2006 (Keegan et al. 2006). Contract loggers in Idaho, eastern Washington, and western Montana rated finding and keeping quality employees as their second highest business constraint, behind only timber supply constraints (Allen 2006). Levels of education, particularly post-secondary education, tend to be lower in rural areas than in urban areas (SRI International 2005), and much of Idaho is rural.

An aging workforce is also of concern to the forest products business sector. Aging population has important implications for labor supply, particularly skilled labor (Schuler and Adair 2003). Contributing to the problem of an aging workforce is the fact that rural counties have experienced an outmigration of young people (SRI International 2005).

The rising cost of healthcare is another workforce related issue. One major concern expressed by Idaho mill managers for 2006 was increasing health insurance costs (Keegan et al. 2006).

Shortages of labor are already forcing the homebuilding industry to speed up the industrialization process in order to reduce labor costs and improve productivity to remain profitable. Industrialization will mean that more components of a home, such as floor trusses, roof trusses, wall panels, and prehung doors and windows, will be made in a factory and then delivered to the job site for installation. It could mean more that steel and concrete systems will replace wood-based components (Schuler and Adair 2003).

Chapter 5. Opportunities

In this chapter, we identify policy initiatives and programs that are aiding or may aid the forest products business sector in Idaho in reaching its potential. We do so without defining what that potential is because it is dependent on many interrelated factors for which we lack information or cannot accurately predict the future, including world markets, technological innovation, and business savvy. Most of the initiatives we identify are related to public policies, but we also provide ideas from reports in other states about actions the forest products business sector itself could take. We also focus on policy initiatives that could be implemented by state or local entities. We briefly touch on federal policies, even though changing them is difficult for Idaho's federal congressional delegation, state and local governments, and businesses within the forest products sector to accomplish individually or collectively.

General economic conditions and market trends, both domestically and worldwide, affect the forest products business sector in Idaho. Demand and markets for forest products appear to be expanding worldwide, particularly in Asia (Howard 2004, Turner et al. 2005). Historically, the demand for residential housing has been a key variable in the success of the forest products industry because two-thirds or more of structural lumber and panel products are consumed in new housing and remodeling (Schuler and Adair 2003). Because the underlying demographic foundations for housing in the U.S. are expected to remain strong, the demand for building materials is expected to remain strong (Haynes et al. 2003, Schuler and Adair 2003). The Idaho forest products business sector has the opportunity to help meet U.S. and worldwide demand for forest products, but to do so Idaho business firms must be able to compete with manufacturers of forest products in other U.S. regions and other countries.

5.1. Policies Addressing Raw Material Availability

As we have pointed out earlier in this report (section 4.1), one of the major challenges facing the forest products business sector is the availability of raw material. In this section we look at policies at the federal and state levels that may help address this issue.

5.1.1. Federal lands policies. Timber harvests from national forests have decreased dramatically since 1990 (see sections 1.2 and 4.1). Given the attitudes, values, and beliefs that Americans currently hold about public lands in general, national forest management, and resource development on national forests (Lybecker et al. 2005), it seems unlikely that major changes in federal policy will be forthcoming that could increase timber supplies from national forests to the levels of the 1960s through the 1980s. However, current efforts to reduce fire hazards on federal lands may result in increased availability of raw materials for some wood-based products.

The Healthy Forest Initiative is a package of administrative and legislative changes undertaken by the Bush administration to implement the National Fire Plan by reducing the risks of wildfire on federal lands. Fuels reduction is a large part of the strategy on the ground. Woody materials removed during hazardous fuels reduction and landscape restoration activities may be utilized in some manufactured products (e.g., lumber, engineered wood products, paper and pulp, furniture) and bio-energy and bio-based products (e.g., plastics, ethanol, and diesel) (USDA Forest Service and U.S. Department of Interior 2005b).

The measure of accomplishment commonly reported for fuels reduction is acres treated, not volume of trees removed, so it is difficult to determine how much of the material removed is used to manufacture forest products. The U.S. Forest Service and the Department of Interior estimate that they have treated about one million acres nationwide for fuels reduction using mechanical methods. Of these one million acres, 28% have included utilization of removed material for forest products, bio-energy, and bio-based products (USDA Forest Service and U.S. Department of Interior 2005b).

Between fiscal years 2003 and 2006, the U.S. Forest Service treated 304,288 acres for fuels reduction in Idaho, of which 156,822 acres were mechanically treated (Table 5-1). More projects are underway. For example, the Two Mile Wildland Urban Interface Hazard Reduction Project has a goal to treat 1,100 acres in the Panhandle National Forests and will result in the harvest of about 4.8 million board feet of timber. It is being accomplished under the Healthy Forest Restoration Act of 2003, part of the Healthy Forest Initiative.(USDA Forest Service 2005a).

Stewardship contracting is a policy mechanism developed in the late 1990s that national forest managers are using more often to accomplish their mission (Pinchot Institute for Conservation 2005; USDA Forest Service 2005b). Objectives for stewardship contracting projects include reducing

Table 5-1. Acres of fuels treatment accomplishments for Idaho by the U.S. Forest Service, FY 2003-2006.

	Wildland Urban Interface			Other			
Fiscal Year	Fire	Mechanical	Sub-total	Fire	Mechanical	Sub-Total	Total
FY 2003	7,745	8,136	15,881	6,533	700	7,233	23,114
FY 2004	12,793	22,770	35,563	32,137	27,588	59,725	95,288
FY 2005	10,430	31,495	41,925	22,510	22,195	44,705	86,630
FY 2006	10,189	27,090	37,279	45,129	16,848	61,977	99,256
Total FY 2003-FY 2006	41,157	89,491	130,648	106,309	67,331	173,640	304,288

Source: USDA Forest Service and U.S. Department of Interior 2005a.

hazardous fuels within "wildland urban interface" (WUI) areas, reducing hazardous fuels outside of WUI areas, reducing insect and disease risks, improving wildlife habitat, and controlling invasive weeds (USDA Forest Service 2005b). Nationwide in FY 2005, 196 million cubic feet of timber were sold from stewardship contracting projects (USDA Forest Service 2006a), or roughly 980 million board feet. Although Idaho has 16 stewardship contracting projects on national forests (USDA Forest Service 2006b), we were unable to determine from published sources how much timber came from them.

5.1.2. Idaho endowment lands policy. The Idaho Department of Lands, in fulfilling its mission to provide "maximum long term financial return" for endowment land beneficiaries, has determined that the sustainable harvest levels from state endowment lands can be increased. In 2004, the Idaho State Board of Land Commissioners authorized an increase in timber harvests from state endowment lands to 30 million board feet per year (IDL 2004). This increase of approximately 15% from previous levels will be phased in beginning in FY 2006.

5.1.3. Policies for increased biomass utilization. Much of the woody material being removed from forests as a result of fire hazard reduction projects is small-diameter timber and other woody biomass not traditionally used by the forest products industry for primary solid wood products such as lumber. Research and development projects are underway to find uses for smaller-diameter trees, including traditional uses (e.g., lumber, poles/posts, and pulp chips), value-added products (e.g., flooring, paneling, cabinets, furniture, and millwork), and residue uses (e.g., biomass energy, ethanol, firewood, pulp, and composting) (LeVan-Green and Livingston 2001).

Numerous federal laws and policies are spurring research, development, and investment in biomass projects, including the Biomass Research and Development Act of 2000 (P.L. 106-224), Executive Order 13134, several sections of the 2002 Farm Bill, the Healthy Forest Restoration Act of 2003, and the National Energy Policy Act of 1992, among others (USDOE 2005a), including the Energy Policy Act of 2005. Policies related to biomass utilization at the state level could include ethanol production incentives, renewable portfolio standards, grants and loans, tax incentives, industrial recruitment incentives, rebate programs, green power purchasing/aggregation policies, utility green pricing programs, and outreach programs (USDOE 2005b). The state of Idaho is currently not developing policies to encourage woody biomass utilization, although several communities are pursuing initiatives on their own.

In June 2005, the U.S. Forest Service introduced a national strategy for improving woody biomass utilization through its programs and activities (Woody Biomass Utilization Team 2005). The overall goal of the strategy is to increase the utilization of woody biomass from hazardous fuel reduction, forest restoration, and forest management activities on public and private lands to help offset the costs of these activities, provide economic opportunities to rural communities, and enhance environmental benefits. The agency also aims to increase the reliability of an accessible and sustainable woody biomass from National Forest System lands and other federal, tribal, state, and private lands, and to improve utilization through maintaining and enhancing local infrastructure and developing new technologies, businesses, and

markets capable of using low-value woody biomass (Woody Biomass Utilization Team 2005).

Recent studies have found that forest products manufacturers are adapting to smaller-diameter trees for their raw material supply. For example, in Montana, smaller-diameter material is being utilized for sawlogs and veneer logs (Morgan et al. 2005). As a result, the proportion of inventory growing stock volume utilized for manufacturing is increasing. More volume delivered to mills is coming from parts of the tree (i.e., stumps and tops) that have not traditionally been considered part of the growing stock. Also, the quantity of wood waste left on harvest sites is decreasing (Morgan et al. 2005). Idaho forest product manufacturers also are adapting to utilize smaller-diameter trees and increasing manufacturing efficiency (see, for example, Associated Press 2002, Williams 2006).

The transition to smaller-diameter and different woody raw materials is not without challenges. Investment of capital in new plants to handle small-diameter timber is risky (Stewart et al. 2004a, 2004b), especially without an assured long-term supply of raw material. Investing in a new mill may be more economically feasible than retooling an old one (Stewart et al. 2004a).

5.2. Economic Development

The strengths of rural areas in the U.S., including much of Idaho, include: the low cost of doing business, high quality of life and increasingly high levels of entrepreneurship and small business development (SRI International 2005). Weaknesses of rural areas include: uncertainties and resistance to changes needed to adjust to structural economic change, declining population in some areas, quality of education available, difficulty retaining educated residents, and lack of employment opportunities, particularly in growth sectors (SRI International 2005). To attract new economic development to its rural areas, Idaho must retain and emphasize its strengths and work to remedy its weaknesses. New economic development opportunities may take the form of expansion and retention of existing industries through a combination of increased productivity and export expansion or through new business formation and recruitment (Vlosky and Chance 1997).

Idaho competes in a global economy. Recent studies suggest there are eight foundations of state competitiveness focusing on human resources, financial resources, innovation resources, infrastructure, government and regulatory environment, business costs, globalization and dynamism, and quality of life (Table 5-2, SRI International 2005). Policies and programs that enhance these foundations may increase the contributions of the forest products business sector to the state of Idaho.

In addition to policies and programs that enhance economic development at the state level, local economic development programs are important. Three common elements of successful local economic development efforts include organizing and planning, developing alternative strategies, and developing techniques to provide useful support (Bertsch 1990). A broad-based, well-framed community economic develop program would have common elements to one focusing specifically on the forest products business sector. The difference is encountered when general ideas become more specific. If success is to be realized, greater knowledge is required of forest product business location factors, market trends, and community resources to meet the needs of the forest products business sector (Bertsch 1990). Researchers have found that economic development specialists need training in forest products in order to understand how to recruit businesses, including information about value-added wood-based manufacturing, forest resources, local production characteristics, and the availability of financial resources for forest-based development (Smith et al. 1999). A successful community economic development strategy also requires a thorough understanding of the community's ability and willingness to support such an endeavor (Bertsch 1990).

5.2.1. Cluster development. Broadly defined, an industry cluster is a geographic concentration of similar and/or related firms that together provide competitive advantages for members of the cluster and the area economy (Gibson and Glenn 2000, Nacker 2004, Porter 1990). Industry clusters can consist of interconnected companies, specialized suppliers, service providers, and associated institutions in a region. Clusters are a result of history, natural resource advantages, and/or successful entrepreneurial cultures. In recent years, numerous countries, regions of the U.S., and states have aggressively pursued business cluster strategies to better understand their local economies and achieve competitive advantage in the market (Hovee & Co. 2004, Nacker 2004). As other states have done, Idaho may want to consider pursuing strategies that promote forest products clusters.

Table 5-2. Foundations of state competitiveness.

- Human resources
  - Quality of education
  - Workforce characteristics
  - Technology capacity
- Financial resources
  - Capital resources
  - Entrepreneurial support
- Innovation resources
  - Research and development support
  - Collaboration and innovation
- Infrastructure
  - Physical infrastructure
  - Technology networks
- Government and regulatory environment
  - Government size and capacity
  - E-government capacity
  - Regulatory framework
- Business costs
  - Taxes
  - Other costs of doing business
- Globalism and dynamism
  - International linkages
  - Entrepreneurship and business growth
- Quality of Life
  - Standards of Living
  - Health
  - Environment and weather
  - Lifestyle

Source: SRI International 2005.

Economic development interest in clusters began in the early 1990s with publication of Harvard professor Michael Porter's book *The Competitive Advantage of Nations* (1990). Interest has exploded in recent years (Wolfe and Gertler 2004). While the term "clusters" is new, the theory behind them is not. Traditionally industry clusters were defined as groups of sectors linked through input-output relationships, regardless of their geography. Modern industry clusters are premised on the hypothesized relationship between industrial interdependence and spatial proximity (Feser et al. 2005). Spatial definition of industry complexes dates back to the beginning of the twentieth century. The cluster concept theorizes that industry location groupings are based on economic factors such as transportation, labor, and raw material costs differentials (Nacker 2004). Historically important industrial location factors have included raw materials, transportation, markets, labor, capital, water, industrial energy, ecology, climate, community factors, site factors, and the dynamics of industry interdependence (Gibson and Glenn 2000).

One of the challenges for cluster analysis is to accommodate the diverse array of industrial sectors and geographical locales in which clusters are found (Wolfe and Gertler 2004). There remains a lack of consensus regarding how clusters are started and to what extent their emergence can be set in motion by conscious design or policy interventions (Wolfe and Gertler 2004). Firms looking for new locations may have different reasons for locating in a place than those of firms already established in the area (Gibson and Glenn 2000).

Clusters may be a product of traditional "agglomeration" economies in which firms co-located in the cluster benefit from the easier access to, and reduced costs of, particular collective resources, such as specialized infrastructure or access to a local labor market for specialized skills. Clusters may also develop because of specialized knowledge (Wolfe and Gertler 2004). Spatial scale, and how the local scale fits into the regional and national context, is also important in cluster analysis (Wolfe and Gertler 2004). Management culture and practices also affect business location decisions and these need to be taken into account in regional development planning strategies (Doeringer et al. 2005).

Some researchers caution that interest in clusters as a model for development has vastly outstripped current understanding of the key factors or elements that support the growth of clusters (Wolfe and Gertler 2004). It is not clear if there is a unique paradigm for cluster development that cuts across the diverse array of regions and industrial sectors currently attempting to apply the concept as the key to their economic development strategy. Various factors are situationally important, that is, they vary according to the firm, the place, and the time (Bozeman and Bozeman 1987). For example, changes in technology are affecting communication and transportation and reducing spatial transaction costs, which in turn are changing the importance of transportation networks on industrial location behavior (McCann and Shefer 2004).

Lists of "critical factors" provide relatively little in the way of effective guidance for policymakers trying to apply lessons learned elsewhere to their local economy, which may be based on different economic sectors and facing radically different economic prospects (Wolfe and Gertler 2004). For example, some researchers suggest that primary forest product manufacturers are likely to locate in rural areas near timber resources; however, secondary or value-added forest products firms often are located closer to consumer markets such as metropolitan or suburban areas (Vlosky and Chance 1997). Other researchers suggest that specific locational factors for forest products companies are not well understood (Michael et al. 1998). For example, an early 1960s study in West Virginia found that single-owner firms often selected a site because of personal relationships and community factors. That study also found that larger firms put more weight on financial criteria and considered far more alternative sites than smaller firms. Larger firms considered labor and transportation costs as well as wood supply to be important site selection factors (Michael et al. 1998).

Other studies have found that different types of forest product firms have different location decision processes and requirements (Cleaves and O'Laughlin 1986, Michael et al. 1998). For example, some production processes are characterized by a need for highly technical equipment and highly trained employees. The need for such highly skilled people may be an important factor in the site selection decisions of firms employing skilled workers. It is generally easier to move machines and equipment than to relocate a skilled workforce (Michael et al. 1998). In a survey of value-added wood-based manufacturers in Texas, Michael et al. (1998) found the following ranking of factor categories (Table 5-3): cost factors (mean = 5.79 [on a scale of 1 = not important to 7 = very important]), regulatory factors (5.28), production factors (4.88), intangible factors (4.82), market factors (3.65), and distribution factors (3.50).

Researchers examining several types of industrial clusters in Canada discovered some common elements among them (Wolfe and Gertler 2004). Skilled labor was found to be the single-most important local asset in cluster development. In the U.S., other researchers have found that post-secondary education is important in maintaining skilled labor, and the role of community colleges and technical schools is important in rural areas (Henderson and Weiler 2005). New electronic methods of training workers also are emerging (Mason 2005).

Organizational learning also was found to be a key economic process in each case study in Canada (Wolfe and Gertler 2004). Learning takes place within individual firms as well as across firm boundaries in the form of learning from other firms, research institutions, industrial associations, and related institutional elements of the cluster. Learning within the organization is instrumental in enabling established firms to adapt to changing competitive conditions in the global economy, as well as assisting new firms to become more successful innovators.

Leadership within a firm was also found to be an important factor in Canada (Wolfe and Gertler 2004). Leadership is also expressed at a social scale, at the level of the community. Public institutions also were found to be important, including universities and laboratories, as well as public agencies. Location was found to be important, but its effect is more nuanced than other factors, varying more between cases (Wolfe and Gertler 2004).

Public-sector decisions can affect cluster trajectories in a variety of ways, although the impacts are often unpredictable and unintended (Wolfe and Gertler 2004). For example, some local governments in Alabama used property tax abatement strategies to attract pulp and paper industry firms; now these areas lag behind in education in part because property tax revenue for education was decreased (Joshi et al. 2000). Some researchers suggest that few cluster location factors are under the control of state and local governments, and those that are appear to have little effect on location decisions (Bozeman and Bozeman 1987). An emerging hypothesis suggests that public interventions that have the most effect in seeding

Table. 5-3. Facility location factors for value-added wood products companies in Texas ranked by importance to the firm.

Factor (factor category)	Mean Importance[1]
Property taxes (cost)	5.97
Labor costs (cost)	5.91
Facility construction costs (cost)	5.80
Cost of land for facility (cost)	5.77
Room for expansion (production)	5.75
Raw material cost (cost)	5.74
Suitability of existing site (production)	5.67
State/local personal taxes (regulatory)	5.60
Utility costs (cost)	5.55
State/local corporate taxes (regulatory)	5.46
Availability of skilled labor (production)	5.25
Pollution/emissions regulations (regulatory)	5.23
Personal factors (intangible)	5.23
Cost of living (intangible)	5.23
Worker's compensation (regulatory)	5.11
Labor laws (regulatory)	5.03
Potential growth of market (market)	4.91
Tax incentives (intangible)	4.72
Proximity to end markets (market)	4.70
Industrial development aid/incentives (intangible)	4.55
Nearness to lumber supplier (production)	4.49
Nearness to major highways (distribution)	4.47
Access to capital/financing (intangible)	4.36
Local market size (market)	4.32
Access to freight haulers (distribution)	4.24
Proximity to intermediaries (market)	3.96
Less competition for sales (market)	3.65
Nearness to composite panel supplier (distribution)	3.22
Nearness to export markets (market)	2.04
Nearness to trade show locations (market)	1.97
Nearness to rail lines (distribution)	1.80

[1] Scale: 1 (Not Important) to 7 (Very Important).

Source: Michael et al. 1998.

growth of a cluster are ones that contribute to the development of a skilled workforce (Wolfe and Gertler 2004).

An Oregon study (Hovee & Co. 2004) suggests that expanding the view of the forest sector beyond those activities that are most directly dependent on forests may be useful in analyzing and developing a

forest-based cluster (Figure 5-1). This more expansive approach involves a definition for the forest cluster of firms and organizations that support and benefit from the core groupings of primary and secondary products, as well as forestry services. Taken together, this broader set of forest-linked activities offers synergistic opportunities extending beyond what may be possible within the forest sector as more traditionally and narrowly defined. A broader view of clusters is considered important for better assessing future opportunities (Hovee & Co. 2004).

Allied industries are business activities that traditionally may have had direct vendor and customer linkages to primary and secondary forest product sectors, but are neither directly a forestry service nor classified as a primary or secondary activity. Such allied industries would include those with long-standing historic ties, whether as major vendors to or customers of the forest sector, including forest products wholesaling, manufactured housing, printing/publishing, and related machinery manufacturing (Hovee & Co. 2004). Opportunities to expand the forest cluster could occur by developing relationships with other potential partners including: agribusiness—as in packaging; recycling—for newsprint and paperboard; transportation—for supply chain management; architecture and engineering—by specifying wood as a preferred environmentally and energy efficient alternative to other non-renewable sources of building materials; high-tech—with potential applications ranging from light-touch harvest equipment to more sophisticated scanning and milling technology to recover higher value from logs (Hovee & Co. 2004).

The state of Montana undertook an analysis of the wood-based cluster concept in 2003 (Regional Technology Strategies, Inc. 2003a). Actions suggested for aiding cluster development were:

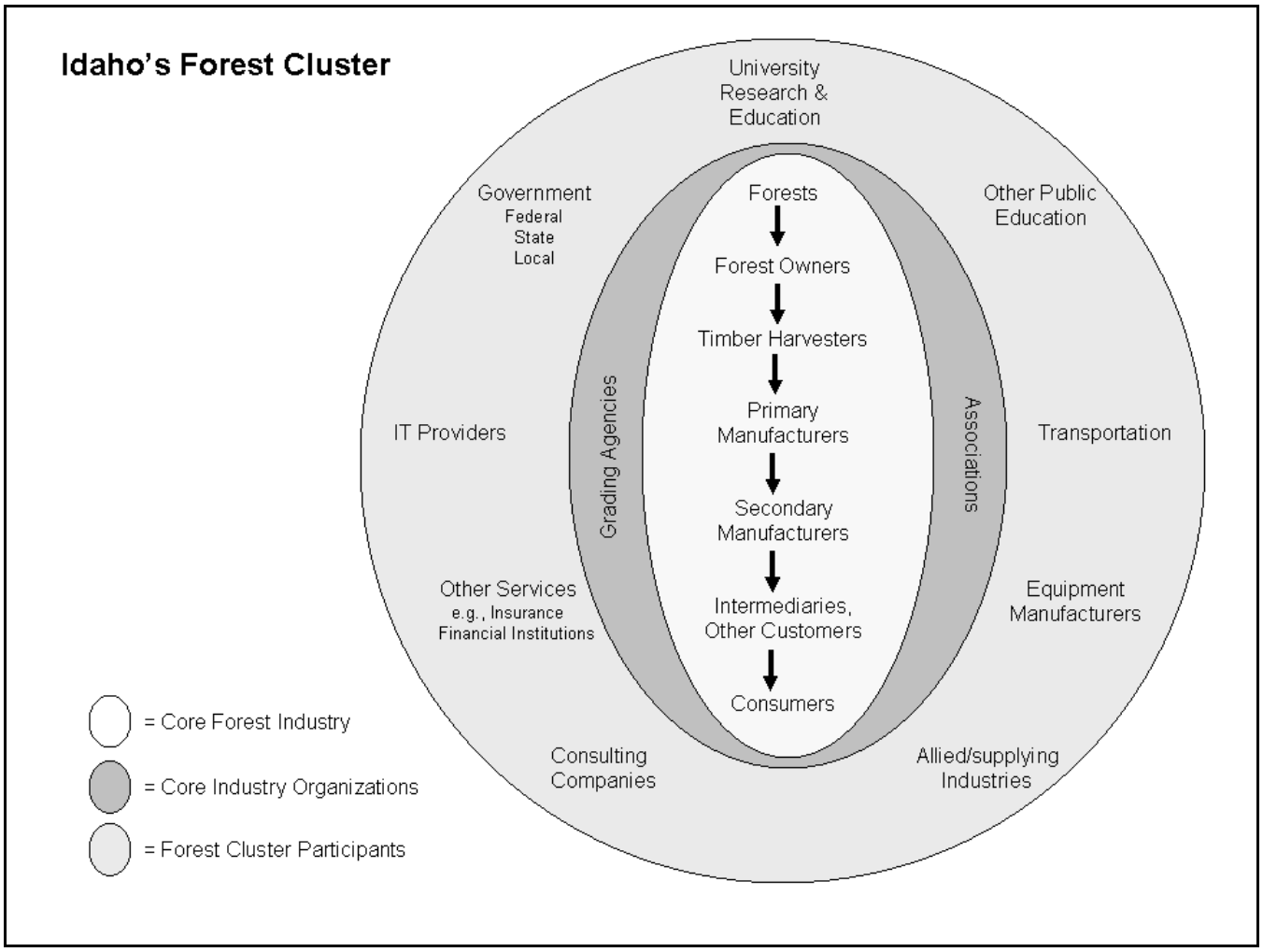

Figure 5-1. Conceptual model of Idaho's forest cluster.

Adapted from: Hovee & Co. 2004.

establish a one-stop resource center for the cluster; organize learning and training networks; establish branding and a Montana Design Center; create a competitive research and innovation grant program to identify new uses or markets for forest products; make Montana parks, roads, and tourism offices showcases for Montana wood; and incubate new creative wood based industries.

Idaho has an opportunity to analyze and further develop the existing forest products cluster. Some work has been done on defining industry clusters in Idaho (e.g., Porter 2002), but none has focused specifically on forest-based industries. Relatively high economic impact multipliers (see section 2.6) suggest that core forest sector activities are well-connected to other sectors of Idaho's economy. The forest sector reaches into many other sectors of Idaho's economy both as a buyer and seller of goods and services to and from other sectors. Concentrating on developing these relationships further could be of benefit to the state.

5.2.2. Innovation, entrepreneurship, and value-added products. Innovation, entrepreneurship, and small business development are likely to be future sources of competitiveness and growth for rural areas (SRI International 2005). Because innovation is one strategy that helps firms compete in this era of globalization, a key to the success of forest product manufacturers in the future may be to focus on new products, new processes, and the use of new raw materials (Hovgaard et al. 2005). A well-developed regional innovation system, including the creation of innovation networks, has been found to be important for rejuvenating older, mature industries (Todtling and Trippl 2004). There is a strong consensus suggesting that the forest products industry will need to invest in technology and product development in order to keep pace with foreign competition (Hovgaard et al. 2005). Idaho ranks high in innovation, as measured by patents and new firms, but most of these are in the high-tech sector (Porter 2002).

The forest products industry faces competition in all markets, and many wood products are at the mature or declining phase of the product life cycle, which suggests that new products must be developed to take their place (Schuler and Adair 2003). For example, housing has been an important determinant of demand for forest products, and construction firms will partner with those building suppliers, manufacturers, and distributors who understand their need to automate, cut costs, and reduce the cycle time at the building site. If wood is to continue to be a preferred building material for housing, the forest products industry must respond to changes in housing industry needs (Schuler and Adair 2003). However, to successfully introduce new products and penetrate the markets for and replace traditionally used materials, it is critical to study and understand the markets and distribution channels of existing products (Yadama and Shook 2005).

Encouraging entrepreneurship in value-added secondary processing of forest products is proving to be an effective strategy for many rural areas (Vlosky 1995, Vlosky and Chance 1997). If primary production jobs are scarce, locally generated secondary forest products jobs may offer a viable alternative to out-migration. Secondary forest products wages often exceed wages of other jobs in rural areas (Vlosky 1995). Development of value-added production also helps to diversify rural economies. Value-added producers that are export oriented increase the economic impact multiplier effect (Vlosky 1995, Vlosky and Chance 1997).

Encouraging innovation and entrepreneurship creates a new role for public policy (Todtling and Trippl 2004). Building public-private partnerships, organizing regionally, coordinating related and complementary programs, getting commitment from public leaders, and targeting sectors and services are key elements to shaping effective value-added wood products initiatives (Birss 1993). Services that might be offered via public institutions or public-private partnerships include: training and education, marketing and export assistance, technological assistance, research, and capital formation assistance (Birss 1993, Maine DECD 2005).

The federal government has numerous support programs directed at rural entrepreneurs and small business development (Table 5-4; SRI International 2005, Thomas and Schumann 1993). Over the last decade, new federal programs for rural areas have increasingly begun to focus on broader business development initiatives, rather than agricultural subsidies. However, given the number of programs spread across numerous agencies, it is difficult to identify and access programs. The effort remains ill-coordinated, difficult to use, and poorly understood by businesses and residents. It also has suffered from complex requirements, lack of funding, and lack of implementation (SRI International 2005). This seems to call for a central information clearinghouse, such as recommended by the National Rural Development Partnership (2004).

Table 5-4. Federal entrepreneurship support programs.

Small Business Administration	**U.S. Department of Agriculture**
• 7(a) Guaranteed Lending Program	• Business and Industrial Guaranteed and Direct Loan Programs
• 504 Certified Development Program	• Intermediary Re-lending Program
• Micro-loan Program	• Rural Business Enterprise and Opportunity Grants
• Service Corps of Retired Executives Program	• Rural Economic Development Grants and Loans
• Women's Business Centers Program	**U.S. Department of Treasury**
• Program for Investment in Micro-entrepreneurs (PRIME)	• Community Development Financial Institutions (CDFI) Fund
• Small Business Development Centers Program	
• Small Business Investment Centers	
• New Markets Venture Capital Companies	
• New Markets Tax Credit	

Source: SRI International 2005.

5.3. Programs from Other States

Before looking at institutions and programs currently existing in Idaho that provide avenues for assistance to the forest products business sector (section 5.4), we briefly review some current programs from other states. These may provide ideas appropriate to Idaho.

5.3.1. Washington. In the 1980s, the state of Washington helped create the Evergreen Partnership, which has become the Evergreen Building Products Association, a private, non-profit corporation, whose primary purpose is to cooperatively aid the development and expansion of international and domestic markets for Pacific Northwest forest products (Evergreen Building Products Association 2005). The Washington State Department of Community, Trade and Economic Development continues to work in cooperation with the Evergreen Building Products Association and employs a business development manager with expertise in building material and wood products to provide strategic market direction and assistance to the value-added wood products and building materials industry of Washington (WSDCTED 2005a).

The Washington State Department of Community, Trade and Economic Development also is responsible for the Forest Products Revolving Loan Fund Program that helps finance projects that implement value-added production processes. Loan amounts range from $50,000 to $1,000,000 (WSDCTED 2005b). In addition, the Washington State Rural Washington Loan Fund provides financial help to businesses that will create new jobs or retain existing jobs, with priority given to timber-dependent and distressed area projects (WSDCTED 2005c). Washington also has investigated cluster-based development strategies for forest products in the state (Sommers 2001).

5.3.2. Oregon. In 1991, the Oregon Legislature created the Oregon Forest Resources Institute to improve public understanding of the state's forest resources and to encourage environmentally sound forest management through training and other educational programs for forest landowners (OFRI 2005). The institute is funded by a dedicated harvest tax on forest products manufacturing firms. Its mission is similar to the Idaho Forest Products Commission described below (section 5.4.1).

Also in 1991, the Oregon Legislature created the Oregon Wood Products Competitiveness Corporation, now the independent, private non-profit Northwest Wood Products Association. Its goal is to improve and promote the competitiveness of Oregon's secondary wood products industry, with its top priorities of access to capital, market development, and workforce preparedness. The association has collaborated with the state's community college system to obtain significant state support for the development and implementation of a community college curriculum for the industry (Regional Technologies Strategies, Inc. 2003b).

In 2005, the Oregon State University College of Forestry and the Oregon State University Extension Service created the Oregon Wood Innovation Center. The center's mission is to work closely with the private forest products industry to improve the competitiveness of Oregon's forest sector, and help the state preserve jobs and better adapt to a challenging global environment (Oregon Wood Innovation Center 2006).

The Oregon Economic and Community Development Department has embarked on cluster-based development initiatives for several major industries including the forest products industry (Oregon ECDD 2005a; Impreza, Inc. 2003; Oregon Business Plan 2003). Oregon also has a Entrepreneurial Development Loan Fund to help businesses get started in the state (Oregon ECDD 2005b).

5.3.3. Wisconsin. In Wisconsin, the governor's office annually provides $250,000 to promote, advertise, publicize, and otherwise market products that are made in Wisconsin from timber that is produced in Wisconsin (Shanovich 2001). More broadly, the state of Wisconsin participates in and helps finance Forward Wisconsin, a public-private state marketing and business recruitment organization created in 1984, has a mission to attract new businesses, jobs, and increased economic activity to the state. The annual budget is approximately $1 million, with the private sector contributing more than half of the funding and the balance coming from the State of Wisconsin (Forward Wisconsin 2005a). Wisconsin also has chosen to pursue a cluster-based strategy to economic development, including the paper industry as one of its featured clusters for growth (Forward Wisconsin 2005b).

5.3.4. Kentucky. Kentucky has a Forest Products Council that provides advice to the Natural Resources and Environmental Protection Cabinet and works to develop the state's primary and secondary wood products industries (Bickford 1996; Kentucky Revised Statutes 154.47-110). The council works with members of the primary and secondary wood products industries and owners of forest resources to foster cooperation in the planning and implementation of forest resources technical assistance and education efforts, including silvicultural best management practices, a forest stewardship program, a master logger program, guidelines for water quality management, forest fire prevention and other technical assistance and education efforts focused on sustaining the development and productivity of Kentucky's forest resources.

In addition, Kentucky has established the Kentucky Wood Products Competitiveness Corporation, a public-private partnership that promotes the development of the state's secondary wood products industries (Kentucky Revised Statutes 154.47-015). The corporation's services include developing workforce training measures and standards to support value-added functions with regard to wood-based processing and manufacturing as well as design and marketing of wood products. It also provides financial support for the deployment of new or improved technology and manufacturing systems to businesses that make value-added wood products.

5.3.5. Pennsylvania. In 1988, Pennsylvania created a target industry program, called the Hardwood Initiative, that included formation of a Hardwoods Development Council (Jones 1990, Pennsylvania Department of Agriculture 2005). The goals of the council are to: improve coordination between state agencies, local development organizations, and universities; maximize the use and delivery of existing state programs; recommend policies to improve the state's business climate; promote the state's hardwood products; improve industry competitiveness through technology transfer, basic and applied research, education, and market analysis; and encourage sound management of the forest resource. Subcommittees focus on: manufacturing technology, market analysis and product development, resource analysis, regulations, and education and technology transfer (Jones 1990).

5.3.6. Maine. Maine has several parallel efforts underway to expand its forest products sectors, including the Governor's Council on the Sustainability of the Forest Products Industry (Maine DECD 2005) and the Maine Future Forest Economy Project (INRS 2005). The recommendations of Maine's report on the future of the forest economy in the state include ways to: encourage capital investment, work collaboratively to create predictability and policy stability, invest in technology, develop entrepreneurial talent in the industry, distinguish Maine products in the marketplace, and improve the ability of Maine forest manufacturers to compete (INRS 2005).

5.4. Idaho Programs

The following sections highlight programs that already exist and that Idaho administers or participates in at some level. Increased and/or focused involvement by and on the forest products business sector may result in further strides toward the sector's potential. Some ideas from other states (section 5.3) may be adaptable and considered as parts of the missions of Idaho's existing institutions, or they may require new institutions or mechanisms for implementation.

5.4.1. Idaho Forest Products Commission. The Idaho Forest Products Commission's mission is to collect and disseminate information about the management of Idaho's public and private forest lands and the forest products industry (Idaho Code § 38-1501 et seq.). The commission's focus is on public education and the forest resource itself, rather than economic development of the forest products business sector. Other states have organizations whose primary mission does focus on development of the forest products business sector (e.g., Oregon and Kentucky, see sections 5.3.2. and 5.3.4 above). Many of Idaho's agricultural product commissions also have economic and market development missions. Perhaps the mission of the Idaho Forest Products Commission could be expanded, or another organization created with a specific mission to assist in the development of the forest products business sector.

5.4.2. Resource Conservation and Development program. The Resource Conservation and Development (RC&D) program is administered by the U.S. Department of Agriculture's Natural Resources Conservation Service. The RC&D program mission is to improve natural resources, establish and improve rural community facilities and services, and expand industry and create jobs (Idaho RC&D Assn. 2005). Idaho has nine RC&D regions, each governed by autonomous, non-profit RC&D Councils.

Several RC&D projects in Idaho are geared towards expanding the potential of the forest products business sector. For example, the Panhandle Lakes RC&D Council is working with the U.S. Forest Service and Idaho Department of Lands to establish demonstration projects for wood-chip heating systems at public schools, a program called "Fuels for Schools" (IDL 2006). The West Central Highlands RC&D Council is helping to finance the re-tooling of a woodworking enterprise in Council, Idaho (Idaho RC&D Assn. 2005). Increased cooperation with RC&D councils may offer more opportunities for the forest products business sector in Idaho.

5.4.3. Idaho Rural Partnership. The Idaho Rural Partnership (IRP) is a group of individuals and federal, state, and local organizations working together to: assess conditions of rural Idaho, advise public policy makers on rural policies and strategies, identify and coordinate services and resources available to rural communities, develop and promote private/public coordination and partnerships, seek solutions to unnecessary impediments to rural development, and facilitate successful implementation of rural initiatives in Idaho (IRP 2005a). It is administered by a board of directors appointed by the Governor. Funding for the organization has traditionally been from the U.S. Department of Agriculture rural development funds. In addition funds have come from Bechtel Corp. at the Idaho National Laboratory facility of the U.S. Department of Energy, Monsanto Corp., and from the Idaho Workforce Development Training Fund (IRP 2005a).

In November 2005, the Idaho Rural Partnership passed a resolution recognizing the importance of the agricultural industry to rural Idaho and calling for the development of policies and strategies that will help the industry to grow and thrive and directing the partnership staff to work with private partners and state and federal policy makers to enhance the potential in Idaho (IRP 2005b). The forest products business sector may want to pursue a resolution specifically addressing similar ideas and develop a closer relationship with the Idaho Rural Partnership.

5.4.4. Forest Products Industry of the Future program. The Energy Policy Act of 1992 mandated that the U.S. Department of Energy work with the largest energy-users in the industrial sector to create a research program for the purpose of encouraging those industries to adopt more energy-efficient practices and technologies. The forest products industry is one of those industries. The U.S. Department of Energy's Industrial Technologies Program (ITP) invests in technology through collaborative research and development partnerships with nine major industries, including the forest products industry (USDOE 2004). Through the Forest Products Industry of the Future (IOF) strategy, the ITP has partnered with the industry to plan and implement a comprehensive energy agenda, entitled *Agenda 2020* (AF&PA 1999), in order to

reduce energy intensity and help ensure the industry's vitality well into the future. The foundation for the agenda is to advance the global competitiveness of the forest products industry by building technological leadership, improving the sustained management of the forest resource as a source of raw material, increasing capacity for meeting environmental requirements with limited capital expenditures, operating costs, and energy consumption, building energy self-sufficiency and take advantage of by-products as a fuel source, and increasing economic viability of recycled wood and paper products (AF&PA 1999). The IOF strategy supports collaborative, innovative research and development of forest product technologies; promotes demonstration of promising technologies; and promotes the implementation of best practices and emerging technologies (USDOE 2005c).

The Energy Division of the Idaho Department of Water Resources is responsible for coordinating the Forest Industry of the Future Project in Idaho (Idaho Department of Water Resources 2002). In 2001, the Energy Division in cooperation with the Intermountain Forest Association, the University of Idaho College of Natural Resources, the Idaho National Environmental and Engineering Laboratory, and several forest product companies published an *Idaho Forest Industry of the Future: Strategic Technology Plan* (Eklund et al. 2001). The collaborators noted that the national *Agenda 2020* (AF&PA 1999) did not match many of the needs of the Idaho forest products industry so they developed in their own, more focused plan. The plan emphasizes collaboration as key to finding solutions for the needs facing Idaho's forest products industry. The collaboration envisioned in the plan is a three-stage process: needs are identified and shared, partnerships are formed to create solutions to those needs, and finally solutions are shared through meetings, showcases, consulting, and licensing agreements (Eklund et al. 2001). Although the plan was completed in May 2001, it has not been actively pursued to date (G. Fleischman, personal communication).

Other states have been more aggressive than Idaho in pursuing the opportunities that the IOF program affords. For example, as part of its IOF program, Wisconsin undertook an assessment of the business climate for forest products industry in the state. It looked at such things as taxes, financial incentives, environmental regulation, small business regulation, and energy costs, and compared these factors to its neighboring states of Michigan and Minnesota (Wisconsin Economic Development Institute, Inc. 2004). Idaho may want to pursue further the opportunities offered by the IOF program.

5.4.5. Workforce Development Council. The Idaho Governor established the Workforce Development Council in 1996 (Executive Order No. 96-19). The mission of the Council is to develop policy and provide oversight for an integrated Idaho workforce development system. Among the goals of the Council are to: assess the needs of business and industry to enhance economic development, based on market sensitivity; establish a comprehensive workforce development delivery system; support comprehensive educational system for all students K-16+ that includes rigorous school-based learning and relevant work-based training; and provide opportunities for and encourage life-long skill development for Idaho's current and transitional workers (Idaho Workforce Development Council 1999). The Workforce Development Council may provide an important opportunity for the forest products business sector to address some of its workforce issues.

5.4.6. Inland Northwest Economic Adjustment Strategy. The Inland Northwest Economic Adjustment Strategy (INEAS) is a partnership between the states of Washington, Oregon, Idaho and Montana, and the Affiliated Tribes of Northwest Indians (INEAS 2004a). The INEAS is designed to address economic distress in the 137 counties and among 23 tribes across the four northwestern states. Much of the distress is a result of decline in natural resource-based industries. INEAS seeks to create new wealth by linking businesses to counties and communities across the region. Funds will be used strategically to support regional business clusters, entrepreneurial development, technology commercialization, and community sustainability. The strategy will focus on specific clusters of related businesses that have a competitive advantage in the Inland Northwest region. Wood-based products are one of the targeted business clusters.

The INEAS is looking to Congress for initial funding of $9 million and authorization to establish the Inland Northwest Regional Partnership which will implement the strategy (INEAS 2004a). A bill to fund the strategy was introduced in the 108th Congress (S.2162, INEAS 2004b), but has not been introduced in the current Congress. The forest products business sector in Idaho potentially could benefit from implementation of the INEAS.

5.4.7. Inland-Northwest Forest Products Research Consortium. The Inland-Northwest Forest Products Research Consortium is a cooperative effort between the Forest Products Department at the University of Idaho, the Bureau of Business and Economic Research at the University of Montana, and the Wood Materials and Engineering Laboratory at Washington State University. The Consortium investigates forest products and utilization problems important to the Inland Northwest, including characterizing the unique physical, mechanical, and chemical properties of the small-diameter timber resource, developing new harvesting and processing systems to deal with small-diameter timber, and developing new products and processing technologies to enhance the value of the changing timber resource (Inland-Northwest Forest Products Research Consortium 2006).

5.5. Conclusions

Idaho's forest products business sector provides important economic benefits to the state. It is not a high-growth sector, but it is highly linked to other sectors of the economy as demonstrated by its multipliers (Peralta 2001). Development strategies that focus entirely on high-growth sectors may miss opportunities for increased contributions from the forest products sector.

Firms desiring to manufacture high value wood products more efficiently, have a greater production capacity, employ a highly skilled workforce, and sell products in foreign and domestic markets, need access to information and specialized assistance. A needs assessment survey is a good place to start (Birss 1993). Idaho is currently without a comprehensive assessment of what the needs of the forest products business sector are.

The availability of raw material has been identified as one of the challenges for the forest products business sector. The amount and types of timber being harvested are changing. The forest products sector must adapt to the changing conditions, and public policies can aid in the transition.

Cluster-based strategies are a current, popular model for economic development programs. Idaho may want to explore these type strategies, as many other states have. With emphasis on innovation and value-added production, the forest products business sector can grow even in the face of traditional raw material availability issues.

Idaho's state government does not have a centralized institution that focuses specifically on development of the forest products business sector; several other states do. Perhaps a public-private partnership could be formed with the mission of helping the forest products business sector reach its potential.

References Cited

AF&PA (American Forest & Paper Association). 1998. AF&PA strategic plan. Available online: <http://www.afandpa.org/Content/NavigationMenu/About_AFandPA/Strategic_Plan/Strategic_Plan.htm> [29 November 2005].

_____. 1999. Agenda 2020: The path forward, an implementation plan. Available online: <http://www.eere.energy.gov/industry/forest/pdfs/forest_roadmap.pdf> [29 November 2005].

Alabama Forestry Commission. 2004. Forest resource report 2004. Available online: <http://www.forestry.state.al.us/publication/pdfs/Forest Resource Report 2004.pdf> [11 November 2005].

Allen, T.T. 2006. A structural assessment of the logging contract business in the Inland Northwest for 2004. M.S. Thesis, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=91335> [19 July 2006].

Area Development Online. 2005. 19th annual corporate survey, 2004. Available online: <http://www.area-development.com/FrameCorpSurvey4.html> [17 November 2005].

Associated Press. 2002. Mill capitalizes on traditionally shunned market. May 21.

_____. 2003. Logging company not pulling up roots. December 7.

_____. 2004. Here is the latest news from around Idaho. December 1.

BEA (Bureau of Economic Analysis), U.S. Department of Commerce. 2005. Annual state personal income. Available online: <http://www.bea.doc.gov/bea/regional/spi/> [17 January 2006].

Bertsch, R.1990. Community preparedness for forest products industry development. Pages 41-47 in *Wood-based Economic Development in the Lake States: Proceedings of a Symposium on Specific Forest Products Opportunities*, St Paul, MN, April 4-6.

Bickford, J.E. 1996. Location, location, location. *Wood & Wood Products* 101(9):92-93.

Birss, H. 1993. Making wood work: Value added policies and programs. Northwest Policy Center, University of Washington, Seattle.

Bozeman, B., and J.L. Bozeman. Manufacturing firms' views of government activity and commitment to site: Implications for business retention policy. *Policies Studies Review* 6:538-553.

CBC (Canadian Broadcasting Company). 2006. Softwood lumber dispute. Available online: <http://www.cbc.ca/news/background/softwood_lumber/> [11 July 2006].

Champ, P.A., K. Boyle, and T.C. Brown, eds. 2003. *A Primer on Nonmarket Valuation*. Kluwer Academic Press, Boston, MA. Available online: <http://www.fs.fed.us/nonmarketprimerdata/index.html> [11 July 2006].

Cleaves, D.A., and J. O'Laughlin. 1986. Analyzing structure in wood-based industry: Part II. Categorizing strategic diversity. *Forest Products Journal* 36(5):11-17.

Cook, P.S., and J. O'Laughlin. 2000. Toward sustainable forest management: Part II—the role and effects of timber harvesting in Idaho. Report No. 19, College of Natural Resources Policy Analysis Group, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=69504> [14 November 2005].

_____. 2001. Taxing forest property: Analysis of alternative methods and impacts in Idaho. Report No. 20, College of Natural Resources Policy Analysis Group, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=69506> [15 November 2005].

Doeringer, P., C. Evans-Klock, and D. Terkla. 2005. Management cultures and regional development: High performance management and the location of new manufacturing plants. *European Planning Studies* 13:815-830.

Eklund, K., R. Arellanes, and G. Fleischman. 2001. Idaho's forestry industry of the future: Strategic technology plan. Prepared by the Energy Division, Idaho Department of Water Resources in cooperation with the Intermountain Forest Association, the University of Idaho College of Natural Resources, and the Idaho National Environment and Engineering Laboratory. Copy on file with authors.

Evergreen Building Products Association. 2005. Website homepage. Available online: <http://www.ep.org/us_home.htm> [22 December 2005].

Feser, E., S. Sweeney, and H. Renski. 2005. A descriptive analysis of discrete U.S. industrial complexes. *Jounral of Regional Science* 45:395-419.

Forward Wisconsin. 2005a. About Forward Wisconsin. Available online: <http://www.forwardwi.com/forward_docs/section.php?section_id=4> [22 December 2005].

_____. 2005b. Industry clusters. Available online: <http://www.forwardwi.com/forward_docs/category.php?category_id=44> [23 December 2005].

Gibson, L., and E. Glenn. 2000. A note on location factors, clusters, and the indirect primary concept. *Economic Development Review* 16(4):63-66.

Harris, C., W. McLaughlin, G. Brown, and D.R. Becker. 2000. Rural communities in the Inland Northwest: An assessment of small rural communities in the Interior and Upper Columbia River basins. General Technical Report PNW-GTR-477, Pacific Northwest Research Station, USDA Forest Service, Portland, OR. Available online: <http://www.fs.fed.us/pnw/pubs/gtr477.pdf> [16 November 2005].

_____, P.S. Cook, and J. O'Laughlin 2002. Forest resource-based economic development in Idaho: Analysis of concepts, resource management policies, and community effects. Report No. 22, College of Natural Resources Policy Analysis Group, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=69507> [2 January 2006].

Haynes, R.W., D.J. Brooks, D.B. McKeever, and K.E. Skog. 2003. Overview. Pages 1-9 in *An Analysis of the Timber Situation in the United States: 1952-2050,* R.W. Haynes, Tech. Coor. General Technical Report PNW-GTR-560, Pacific Northwest Research Station, USDA Forest Service, Portland, OR. Available online: <http://www.fs.fed.us/pnw/pubs/gtr560/gtr560_part1.pdf> [18 July 2006].

Henderson, J., and S. Weiler. 2005. Rural America's new path to workforce skills. *Main Street Economist* (July):1-2. Available online: <http://www.kc.frb.org/RuralCenter/mainstreet/MSE_0705.pdf> [29 November 2005].

Hodges, A.W., W.D. Mulkey, J.R. Alavalapati, D.R. Carter, and C.F. Kiker. 2005. Economic impacts of the forest industry in Florida, 2003. Available online: <http://economicimpact.ifas.ufl.edu/publications/commodity/Fla Foresty Impact Final Report _revised_.pdf> [17 June 2005].

Hovee & Co. 2004. Oregon forest sector contributions & potential. In cooperation with F.P. Marketing Solutions, Corvallis, OR. Prepared for the Oregon Forest Resources Institute, Portland. Copy on file with authors.

Hovgaard, A., E. Hansen, and J. Roos. 2005. Innovation in the forest products industry: An analysis of companies in Alaska and Oregon. General Technical Report PNW-GTR-629, Pacific Northwest Research Station, USDA Forest Service, Portland, OR. Available online: <http://www.fs.fed.us/pnw/pubs/pnw_gtr629.pdf> [16 November 2005].

Howard, J.L. 2004. U.S. forest products annual market review and prospects 2001-2004. Research Note FPL-RN-0292, USDA Forest Service, Forest Products Laboratory, Madison, WI. Available online: <http://www.fpl.fs.fed.us/documnts/fplrn/fpl_rn292.pdf> [11 November 2005].

Idaho DC&L (Department of Commerce and Labor). 2005. Labor market information, data, projected occupations by industry: projected job growth of occupations by industry. Available online: <http://lmi.idaho.gov/cgi/dataanalysis/> [2 November 2005].

Idaho Department of Water Resources. 2002. Forestry. Available online: <http://www.idwr.state.id.us/energy/iof/forest_industry.htm> [29 November 2005].

Idaho Division of Financial Management, Executive Office of the Governor. 2005. Idaho economic forecast, Vol. XXVII, No.4, October. Available online: <http://dfm.idaho.gov/Publications/EAB/Forecast/2005/October/IEF_FullDocument.pdf> [14 November 2005].

Idaho Endowment Fund Invest Board. 2004. Financial statements, State of Idaho Endowment Funds, administered by the Endowment Fund Investment Board, for the year ended June 30, 2004. Available online: <http://www2.state.id.us/lands/LandBoard/EFIB/121404--audit_report.pdf> [1 December 2005].

Idaho RC&D Assn. (Resource Conservation and Development Association). 2005. Special update, Idaho's RC&Ds: Partnerships serving Idaho's communities. Available online: <ftp://ftp-fc.sc.egov.usda.gov/ID/programs/specialupdate_04.pdf> [17 November 2005].

Idaho State Tax Commission. 2005. 2004 market values and property taxes and the effects of the homeowner's exemption. Available online: <http://tax.idaho.gov/propertytax/PTpdfs/2004mkt_value_ ptax.pdf> [21 July 2005].

Idaho Workforce Development Council. 1999. Workforce Development Council. Available online: <http://cl.idaho.gov/wia1/iwdc_vision.pdf> [5 December 2005].

IDL (Idaho Department of Lands). 2002. Annual report 2002. Available online: <http://www2.state.id.us/lands/News/annual_reports/ar_2002.pdf> [21 July 2005].

_____. 2003. Annual report 2003. Available online: <http://www2.state.id.us/lands/News/annual_reports/ar_2003.pdf> [21 July 2005].

_____. 2004. Annual report 2004. Available online: <http://www2.state.id.us/lands/News/annual_reports/ar_2004.pdf> [21 July 2005].

_____. 2005. State & private forestry fact sheet, April 2005. Available online: <http://www2.state.id.us/lands/bureau/ForestAssist/idaho_fact_sheets/apr2005idahofactsheet.pdf> [21 July 2005].

_____. 2006. Idaho Department of Lands: Fuels for Schools. Available online: <http://www.idl.idaho.gov/nat_fire_plan/fuels_for_schools/index.htm> [11 July 2005].

Impreza, Inc. 2003. Oregon industry clusters: A statistical analysis. Available online: <http://www.econ.state.or.us/cluster.pdf> [23 December 2005].

INEAS (Inland Northwest Economic Adjustment Strategy). 2004a. The Inland Northwest Economic Adjustment Strategy, executive summary. Available online: <http://www.inlandnwregion.org/Includes/INEAS Executive Summary Contents.pdf> [17 November 2005].

_____. 2004b. Questions & answers about S. 2162: The Inland Northwest Revitalization Act. Available online: <http://www.inlandnwregion.org/Includes/S2162Q-A.pdf> [21 November 2005].

Inland-Northwest Forest Products Research Consortium. 2006. Inland-Northwest Forest Products Research Consortium. Available online: <http://www.cnrhome.uidaho.edu/forp/consortium> [19 July 2006].

INRS (Innovative Natural Resource Solutions LLC). 2005. Maine future forest economy project: Current conditions and factors influencing the future of Maine's forest products industry. Available online: <http://mainegov-images.informe.org/doc/mfs/fpm/ffe/Complete Report/Maine Future Forest Economy - Final Report.pdf> [28 November 2005].

IRP (Idaho Rural Partnership). 2005a. Frequently asked questions. Available online: <http://irp.idaho.gov/StatePartnership/FAQs/tabid/95/Default.aspx> [29 November 2005].

_____. 2005b. Press release: Resolution highlights $10.4-billion ag & timber industries. Available online:<http://irp.idaho.gov/Portals/1/Press Releases/Ag Resolution Press Kit.pdf> [28 November 2005].

Jones, S.B. 1990. Wood based economic development: Pennsylvania's target industry program. Pages 189-190 in *Wood-based Economic Development in the Lake States: Proceedings of a Symposium on Specific Forest Products Opportunities*, University of Minnesota, Department of Forest Products [and others], St. Paul, April 4-6.

Joshi, M.L. J.C. Bliss, C. Bailey, L.J. Teeter, K.J. Ward. 2000. Investing in industry, underinvesting in human capital: Forest-based rural development in Alabama. *Society & Natural Resources* 13:291-319.

Keegan, C.E., III, J.P. Brandt, F.G. Wagner, K.J. Pavia, S.R. Shook, and K.A. Blatner. 2005a. Idaho's forest products industry: Current conditions and forecast 2005. Station Bulletin 83, Idaho Forest, Wildlife, and Range Experiment Station, Moscow.

_____, T.A. Morgan, F.G. Wagner, P.J. Cohn, K.A. Blatner, T.P Spoelma, and S.R. Shook. 2005b. Capacity for utilization of USDA Forest Service, Region I small-diameter timber. *Forest Products Journal* 55(12):143-147.

_____, J.P. Brandt, F.G. Wagner, S.R. Shook, and K.A. Blatner. 2006. Idaho's forest products industry: Current conditions and forecast 2006. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=88594> [11 July 2006].

Laaksonen-Craig, S., G.E. Goldman, and W. McKillop. 2003. Forestry, forest industry, and forest products consumption in California. Publication 8070, Division of Agriculture and Natural Resources, University of California, Davis. Available online: <http://anrcatalog.ucdavis.edu/pdf/8070.pdf> [9 January 2006].

Legislative Services Office, Idaho State Legislature. 2004. Fiscal sourcebook, 2004. Available online: <http://www.legislature.idaho.gov/Budget/publications/PDFs/FiscalSourcebook/FY2005/FSBFrame.htm> [1 December 2005].

_____. 2005. Legislative fiscal report for the fiscal year 2006. Available online: <http://www.legislature.idaho.gov/Budget/publications/PDFs/LFR/FY2006/LFRFrame.htm> [2 December 2005].

LeVan-Green, S.L., and J. Livingston. 2001. Exploring the uses for small-diameter trees. *Forest Products Journal* 51(9):10-21.

Lybecker, D.L., D.J. Shields, and M. Haefele. 2005. Survey responses from the Intermountain West: Are we achieving the public's objectives for forests and rangelands? General Technical Report RMRS-GTR-160, USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO. Available online: <http://www.fs.fed.us/rm/pubs/rmrs_gtr160.pdf> [16 November 2005].

Maine DECD (Department of Economic and Community Development). 2005. Final report, Governor's Council on the Sustainability of the Forest Products Industry. Maine DECD, Augusta. Available online: <http://www.econdevmaine.com/resources/pdfs/Governors_Council_on_Sustainability_of_Forest_Products_Industry.pdf> [11 November 2005].

Mason, B. 2005. The A's, B's, C's and D's of E-learning in your plant. *Wood Digest* 36(7):42-44.

McCann, P., and D. Shefer. 2004. Location, agglomeration and infrastructure. *Papers in Regional Science* 83:177-196.

Michael, J.H., J. Teitel, and J.E. Granskog. 1998. Production facility site selection factors for Texas value-added wood producers. *Forest Products Journal* 48(7/8):27-32.

MIG (Minnesota IMPLAN Group, Inc.). 2005. Website hompage. Available online: <http://www.implan.com> [14 December 2005].

Morgan, T.A.., C.E. Keegan, III, T.P. Spoelma, T. Dillon, A.L. Hearst, F.G. Wagner, and L.T. DeBlander. 2004. Idaho's forest products industry: A descriptive analysis. USDA Forest Service, Rocky Mountain Research Station, Resource Bulletin RMRS-RB-4. Available online: <http://www.fs.fed.us/rm/pubs/rmrs_rb004.pdf> [20 July 2005].

_____, T.P. Spoelma, C.E. Keegan, A.L. Chase, and M.T. Thompson. 2005. Montana logging utilization, 2002. Research Paper RMRS-RP-52, USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO. Available online: <http://www.fs.fed.us/rm/pubs/rmrs_rp052.pdf> [16 November 2005].

Nacker, R.M. 2004. Evaluation of forest products industry cluster in Wisconsin and recommendations for economic development actions. Available online: <http://www.wi-edi.org/docs/ForestClusterPaper.pdf> [20 July 2006].

National Rural Development Partnership. 2004. Creating a rural grant clearinghouse. Available online: <http://www.rurdev.usda.gov/nrdp/national/taskforces/grant_clearing_house.html> [11 July 2006].

NCIF & NCFA (North Carolina Industries of the Future and North Carolina Forestry Association). 2003. The state of our forest products industry. Available online: <http://www.ncforestry.org/15593_NCF.pdf> [9 November 2005].

OFRI (Oregon Forest Resources Institute). 2005. About OFRI. Available online: <http://www.oregonforests.org/content/about.asp?section=2&content=1 > [22 December 2005].

O'Laughlin, J. 1990. Idaho's endowment lands: A matter of sacred trust. Report No. 1, College of Natural Resources Policy Analysis Group, University of Idaho, Moscow.

_____. 2001. Softwood lumber imports from Canada. Issue Brief No. 1, College of Natural Resources Policy Analysis Group, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=69462> [16 December 2005].

_____. and R.A. Williams. 1988. Forests and the Texas economy. Publication B-1596, Texas Agricultural Experiment Station, Texas A&M University, College Station.

_____, W.R. Hundrup, and P.S. Cook. 1998. History and analysis of federally administered lands in Idaho. Report No. 16, College of Natural Resources Policy, Analysis Group, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=90761> [11 July 2006].

_____, and P.S. Cook. 2001. Endowment fund reform and Idaho's state lands: Evaluating financial performance of forest and rangeland assets. Report No. 21, College of Natural Resources Policy Analysis Group, University of Idaho, Moscow. Available online: <http://www.cnrhome.uidaho.edu/default.aspx?pid=69354> [22 December 2005].

Oregon Business Plan. 2003. Refocus economic development on industry clusters. Available online: <http://www.oregonbusinessplan.org/pdf/EconDev(Cluster)Summit2003DiscussionPaper.pdf> [3 December 2005].

Oregon ECDD (Economic and Community Development Department). 2005a. Oregon's industries. Available online: <http://www.econ.state.or.us/industries.htm> [23 December 2005].

_____. 2005b. Entrepreneurial Development Loan Fund. Available online: <http://www.econ.state.or.us/edlf.htm> [23 December 2005].

Oregon Wood Innovation Center. 2006. About the Oregon Wood Innovation Center. Available online: <http://owic.oregonstate.edu/about.php> [19 July 2006].

Pennsylvania Department of Agriculture. 2005. Hardwoods Development Council. Available online: <http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?q=127137> [23 December 2005].

Peralta, M.L. 2001. Multipliers and linkages: A study of Idaho's economy. M.S. Thesis, University of Idaho, Moscow.

Pinchot Institute for Conservation. 2005. Implementation of multiparty monitoring and evaluation: Final perspectives on the USDA Forest Service stewardship end results contracting demonstration program, FY 2004, report to the USDA Forest Service. Available online: <http://www.fs.fed.us/forestmanagement/projects/stewardship/reports/documents/FY04_pilot_final.pdf> [18 July 2006].

Porter, M.E. 1990. *The Competitive Advantage of Nations.* Free Press, New York.

_____. 2002. Idaho: Profile of the state economy. Prepared for Governor Dirk Kempthorne, National Governors Association Winter meeting, February 24, Washington, DC. Available online: <http://www.isc.hbs.edu/idaho_02-26-02.pdf> [11 November 2005].

Random Lengths. 1990-2005. Weekly report. Available online: <http://www.randomlengths.com/> [17 July 2006].

Regional Technologies Strategies, Inc. 2003a. Clusters of creativity: Innovation and growth in Montana, a report to the Montana Governor's Office of Economic Opportunity on the wood-based products cluster. Available online: <http://www.rtsinc.org/publications.html> [22 December 2005].

_____. 2003b.Wood products cluster in Oregon USA. Available online: <http://www.rtsinc.org/rc/wood_or.pdf> [22 December 2005].

Riall, B.W. 2003. Economic benefits of the forest industry in Georgia: 2002. Available online: <http://www.gfc.state.ga.us/Resources/Publications/ForestMarketing/Final2002ImpactReport.pdf> [21 November 2005].

Robertson, G.C. 2003. A test of the economic base hypothesis in the small forest communities of southeast Alaska. General Technical Report PNW-GTR-592, USDA Forest Service, Pacific Northwest Research Station, Portland, OR. Available online: <http://www.fs.fed.us/pnw/pubs/gtr592.pdf> [16 November 2005].

Schuler, A., and C. Adair. 2003. Demographics, the housing market, and demand for building materials. *Forest Products Journal* 53(5):8-17.

Shanovich, R. 2001. Forest products marketing (Commerce—Departmentwide and Economic Development). Paper # 280, Joint Committee on Finance, Legislative Fiscal Bureau, Madison, WI. Available online: <http://www.legis.state.wi.us/lfb/2001-03budget/2001-03budgetpapers/280.pdf> [11 November 2005].

Smith, R., D. Alderman, and A.L. Hammett. 1999. Evaluating forest-based economic development training needs in Virginia. *Forest Products Journal* 49(4):19-23.

Smith, W.B., P.D. Miles, J.S. Vissage, and S.A. Pugh. 2004. Forest resources of the United States, 2002. General Technical Report NC-GTR-241, USDA Forest Service, North Central Research Station, St. Paul, MN. Available online: <http://www.ncrs.fs.fed.us/pubs/gtr/gtr_nc241.pdf> [17 November 2006].

Sommers, P. 2001. Cluster strategies for Washington. Report for the Office of Trade and Economic Development. Northwest Policy Center, University of Washington, Seattle. Available online: <http://cted.wa.gov/_cted/documents/ID_114_Publications.pdf> [22 December 2005].

SRI International. 2005. Crafting a competitive future: Capitalizing on rural America, a policy forum. Available online: <http://www.sri.com/policy/csted/reports/economics/Capitalizing_on_Rural_America.pdf> [28 November 2005].

Stewart, H.G., K.A. Blatner, F.G. Wagner, and C. Keegan III. 2004a. Risk and feasibility of processing small-diameter material in the U.S. West, Part I: Structural lumber. *Forest Products Journal* 54(12):97-103.

_____, K.A. Blatner, and C. Keegan III. 2004b. Risk and feasibility of processing small-diameter material in the U.S. West, Part II: Market pulp and oriented strandboard. *Forest Products Journal* 54(12):104-108.

Todtling, F., and M. Trippl. 2004. Like Phoenix from the ashes? The renewal of clusters in old industrial areas. *Urban Studies* 41:1175-1195.

Thomas, M.G., and D.R. Schumann. 1993. Income opportunities in special forest products: Self-help suggestions for rural entrepreneurs. Agricultural Information Bulletin 666, USDA Forest Service, Washington, DC. Available online: <http://www.fpl.fs.fed.us/documnts/usda/agib666/aib666.pdf> [11 November 2005].

Turner, J.A., J. Buongiorno, S. Zhu, and J.P. Prestemon. 2005. The U.S. forest sector in 2030: Markets and competitors. *Forest Products Journal* 55(5):27-36.

USDA Forest Service. 2005a. Coeur d'Alene River Ranger District, Two Mile Resource Area, decision notice. Available online: <http://www.fs.fed.us/ipnf/eco/manage/nepa/cdanepa/2mile/2mi05dn.pdf> [18 November 2005].

_____. 2005b. Forest Service implementation during FY 2004 of the stewardship contracting authority provided by Section 323 the Department of Interior and Related Agencies Appropriations Act, 2003 (as contained in Division F of P.L. 108-7; 16 U.S.C. 2104 Note): A report to the Appropriations Committees of the U.S. House and Senate. Available online: <http://www.fs.fed.us/forestmanagement/projects/stewardship/reports/documents/FY_04_programmatic_report.pdf> [18 July 2006].

_____. 2006a. 2005 Stewardship Contracting accomplishments. Available online: <http://www.fs.fed.us/forestmanagement/projects/stewardship/reports/documents/FY2005_Stewardship_Contracting_Accomplishments.pdf> [18 July 2006].

_____. 2006b. Idaho Stewardship Contracting projects. Available online: <http://www.healthyforests.gov/initiative/steward-projects_states/idaho.html> [18 July 2006].

_____ and U.S. Department of Interior. 2005a. Healthy Forest Initiative website. Available online: <http://fireplan.gov/hfi/fuel_treatments.cfm?statename=idaho> [16 November 2005].

_____ and U.S. Department of Interior. 2005b. Healthy Forests Report, September 12, 2005. Available online: <http://www.healthyforests.gov/projects/healthy_forests_report_09_14_2005.pdf> [16 November 2005].

U.S. Department of Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2001. 2001 national survey of fishing, hunting, and wildlife associated recreation, Idaho. FHW/01-ID Rev. Available online: <http://www.census.gov/prod/2003pubs/01fhw/fhw01-id.pdf> [16 November 2005].

USDOE (U.S. Department of Energy). 2004. Industrial Technologies Program: Industries of the Future. Available online: <http://www.eere.energy.gov/industry/program_areas/industries.html> [29 November 2005].

_____. 2005a. Biomass program: Federal biomass policy. Available online: <http://www.eere.energy.gov/biomass/federal_biomass.html> [29 November 2005].

_____. 2005b. Biomass program: State policies related to biomass. Available online: <http://www.eere.energy.gov/biomass/state_policy.html> [29 November 2005].

_____. 2005c. Industrial Technologies Program: Forest Products. Available online: <http://www.eere.energy.gov/industry/forest/index.html> [29 November 2005].

USTR (U.S. Trade Representative). 2006. U.S., Canada reach final agreement on lumber dispute. Available online: <http://www.ustr.gov/Document_Library/Press_Releases/2006/July/US,_Canada_Reach_Final_Agreement_on_Lumber_Dispute.html> [11 July 2006].

Vlosky, R.P. 1995. U.S. economic development programs for the wood products industry. Working Paper #7, Louisiana Forest Products Laboratory, Louisiana State University Agricultural Center, Baton Rouge, LA. Available online: <http://www.rnr.lsu.edu/lfpl/publication/papers/POLPR.pdf> [11 November 2005].

_____, and N.P. Chance. 1997. Forest products industry and rural economic development: The policy maker's perspective. Working Paper #15, Louisiana Forest Products Laboratory, Louisiana State University Agricultural Center, Baton Rouge, LA. Available online: <http://www.rnr.lsu.edu/lfpdc/publication/papers/PPWP15.pdf> [11 November 2005].

_____, and _____. 2001. Employment structure and training needs in the Louisiana value-added wood products industry. *Forest Products Journal* 51(3):34-41.

Williams, E. 2002. Lewiston port loses wood chip plant; Closure results in loss of eight jobs. *Lewiston Morning Tribune*, July 21, p. 3E.

_____. E. 2003. Kooskia mill trims workers, blames lack of fed timber sales; CFI is down to only 40 operational hours per week. *Lewiston Morning Tribune*, August 10, p. 1E.

_____. 2006. Computer makes the cut at new mill; Technology trims logs to make crucial difference between profit and loss. *Lewiston Morning Tribune*, February 19, p. 1E.

Wilson, M.J., and D.D. Van Hooser. 1993. Forest statistics for land outside national forests in northern Idaho, 1991. Resource Bulletin INT-RB-80, USDA Forest Service, Intermountain Research Station, Ogden, UT.

Wisconsin Economic Development Institute, Inc. 2004. Wisconsin forest products industry business climate status report 2004. Available online: <http://www.cctinc.org/BusinessClimateStatusRptRevised.pdf> [11 November 2005].

Wolfe, D.A., and M.S. Gertler. 2004. Clusters from the inside and out: Local dynamics and global linkages. *Urban Studies* 41:1071-1093.

Woody Biomass Utilization Team. 2005. A national strategy for improving woody biomass utilization through USDA Forest Service programs and activities. USDA Forest Service, Washington, DC. Available online: <http://www.fs.fed.us/forestmanagement/WoodyBiomassUtilization/documents/FS_Woody_Biomass_Strategy_06282005.pdf> [29 November 2005].

WSDCTED (Washington State Department of Community, Trade and Economic Development). 2005a. Industry expertise. Available online: <http://cted.wa.gov/portal/alias__CTED/lang__en/tabID__158/DesktopDefault.aspx> [22 December 2005].

_____. 2005b. Forest products revolving loan fund. Available online: <http://qa.cted.wa.gov/portal/alias__cted/lang__en/tabID__91/DesktopDefault.aspx> [22 December 2005].

_____. 2005c. Rural Washington loan fund. Available online: <http://qa.cted.wa.gov/portal/alias__cted/lang__en/tabID__87/DesktopDefault.aspx> [22 December 2005].

WWPA (Western Wood Products Association). 2005. *2004 Statistical Yearbook of the Western Lumber Industry.* Western Wood Products Association, Portland, OR.

Yadama, V., and S. Shook. 2005. Wood-plastic composite extrusion technology for sustainable economic development of local communities. Pages 63-67 in R.L. Deal and S.M. White (eds.), Understanding key issues of sustainable wood production in the Pacific Northwest. General Technical Report PNW-GTR-626, Pacific Northwest Research Station, USDA Forest Service, Portland, OR. Available online: <http://www.fs.fed.us/pnw/pubs/pnw_gtr626.pdf > [16 November 2005].

Personal Communication

Fleischman, Gerald. Energy Division, Idaho Department of Water Resources. November 29, 2005.