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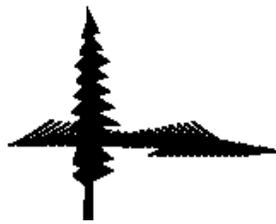
**The Value Added Forest Products  
Industry in Oregon Preliminary Research**

**EWP Working Paper Number 9  
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**The Ecosystem Workforce Program  
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*Ecosystem Workforce Program Working Papers* series offers in-depth reports on applied research, analysis and findings about a variety of areas associated with the effort to build quality jobs in ecosystem management. The target audience includes policy and administrative leaders, academics, leaders in community forestry, community-based organization leaders, and local community officials.



## **ECOSYSTEM WORKFORCE PROGRAM**

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## **Introduction**

This report is the result of a preliminary literature review to understand the state of the value-added forest products industry in Oregon and how it has changed over the last two decades. The first section describes the overall trends in Oregon's forest product industry as a whole over the last two decades, particularly looking at the relative changes in the primary and secondary wood products industries. Standard Industrial Classification (SIC) codes are used to provide a basic understanding of these trends at the State level, as well as for Lake, Klamath, Jackson and Josephine Counties. The second section includes some general information concerning markets for value-added wood products. The final section identifies questions and next steps for further research to gain a more complete picture of opportunities in the value-added industry in Oregon. Attached as an appendix is the literature review of sources used in this report and other documents related to the value-added industry.

## **Overview of the forest products industry in Oregon**

Harvest levels and primary wood products production in Oregon decreased dramatically throughout the 80's and 90's, due in large part to changing forest policies. Between 1988 and 1999, the timber harvest in Oregon declined by 60% from 8,615 MMBF (million board feet) to 3,542 MMBF. There was an 89% decline on federal lands, a 48% decline on state lands, and a 13% decline on private lands. Log consumption dropped from 8.8 billion board feet to 4.5 billion board feet, lumber production declined by 36%, and softwood plywood production declined by 56%. The number of mills during this period dropped from 360 to 200 (Gebert et al. 2002).

During this same period, employment in the wood-using industries in Oregon declined by 20%, from 89,963 workers to 71,360 workers. Although this decrease in employment is significant, it is proportionally much smaller than the decrease in harvest levels and primary wood products production. This is due to several factors, including the use of timber from other states and Canada (a 10% increase); a reduced volume of log exports (76% decrease); increased use of recycled fiber by pulp, paper, and board mills; more labor-intensive harvesting practices owing to environmental and aesthetic considerations; the use of lower quality timber, which require more labor to harvest and process; and perhaps most importantly with regards to this report, the expansion of the secondary wood products industry (Gebert et al. 2002).

During the 1990's, employment in the secondary wood products industry increased by 7%, and the industry generated 23,259 jobs, a labor income of \$752 million, and a sales value of \$2.9 billion.

Employment per MMBF doubled from 10 workers per MMBF to 20 (Gebert et al. 2002).

## A profile of the wood products industry in 1998

Gebert et al. have compiled detailed data on the wood products industry in the year 1998, and this may serve as the most current 'snapshot-in-time' available. Table 1 shows the direct economic effects of Oregon's wood products industry in 1998, and Table 2 details secondary wood products manufacturers by sector in 1998.

Table 1: Direct economic effects of Oregon's wood products industry in Oregon, 1998

<b>Industry</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Sales Value</b>
Forestry	7,033	281,980,000	
Logging	13,187	424,903,965	
Primary forest products	31,338	1,337,383,953	7,461,600,801
<b>Secondary forest products</b>	<b>23,259</b>	<b>751,822,059</b>	<b>2,881,053,839</b>
Total	74,817	2,796,089,977	10,342,654,640

(Gebert et al. 2002)

Table 2: Profile of Oregon's secondary wood products manufacturers by sector, 1998

<b>Industry</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Sales</b>
Trusses, structural building components	2003	72,224,500	606,305,745
Doors, windows, moulding, cutstock	8,120	252,428,766	700,925,377
Wood preservation	458	16,231,479	104,514,387
Wood kitchen cabinets	1,526	42,722,299	123,991,820
Wood containers	434	9,222,206	51,869,477
Wood buildings and mobile homes	3,697	121,222,033	427,877,104
Wood furniture	3,207	86,058,057	228,413,823
Pulp & paper products	2,866	126,887,851	561,578,000
Other	947	24,824,868	75,578,105
<b>Total</b>	<b>23,258</b>	<b>751,822,059</b>	<b>2,881,053,838</b>

(Gebert et al. 2002)

Table 2 shows that firms manufacturing doors, windows, moulding, and cutstock generated the most sales revenue at \$701 million, nearly a quarter of total sales value, and also employed the most people and paid out the most labor income. Trusses and structural building components captured the next largest sales revenue, but ranked fifth in terms of labor income and employment. The second largest sector in terms of employment was wood buildings and mobile homes. The second largest sector in terms of labor income was secondary pulp and paper products. Together, the top four sectors in terms of labor income and employment accounted for 67% of sales value, 77% of employment, and 78% of labor income. The smallest sector was manufacturers of wood containers. This data, however, reflects employment and sales captured within SIC (standard industrial classification) codes. Individually-operated businesses, which are likely common in the niche value-added industry sectors, are not reflected here.

This information from 1998 provides a rough understanding of what is currently happening within different sectors of the secondary wood products industry, at least as far as it is captured by SIC codes. The following section uses data from Oregon Covered Employment, again organized by SIC codes, to track the trends within each sector over time, as well as to provide a rough idea of trends in Klamath, Lake, Jackson, and Josephine Counties.

### **Trends within the Secondary Wood Products sectors**

The data presented here is from Oregon Covered Employment<sup>1</sup> for the year 2000, which provides the numbers of employees that year that are covered for unemployment. As such it does not include independent business owners, independent transporters, and other small operators that do not hire employees. The reality may be that this excludes an important segment of the value-added industry, but this data does give a rough picture of trends in the industry. Data used here is from SIC 24 (lumber and wood products) and SIC 25 (furniture and fixtures). SIC 26 (pulp and paper products) is relevant to the wood products industry, although not included here because it is not significantly relevant to the value-added industry in rural Oregon. Data is available for the state at the four-digit SIC level, meaning it is possible to show state-wide trends within specific sectors. The sectors chosen within SIC 24 and SIC 25 are ones

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<sup>1</sup> All Oregon Covered Employment information is from the Oregon Employment Department, including all of the graphs.

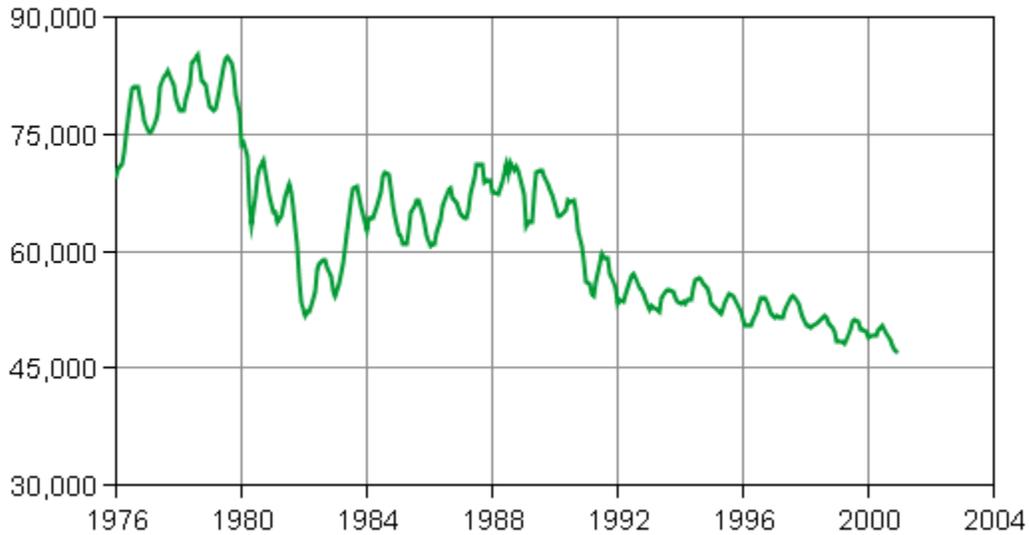
related to the secondary wood products industry. At the county-level, data is only available at the 2-digit level, although this still provides useful information about trends in those counties.

The graphs are meant to portray overall trends. The ‘jaggedness’ of the graphs indicate undulations typical of most industries, and could be due to any number of factors influencing a sector in a particular year.

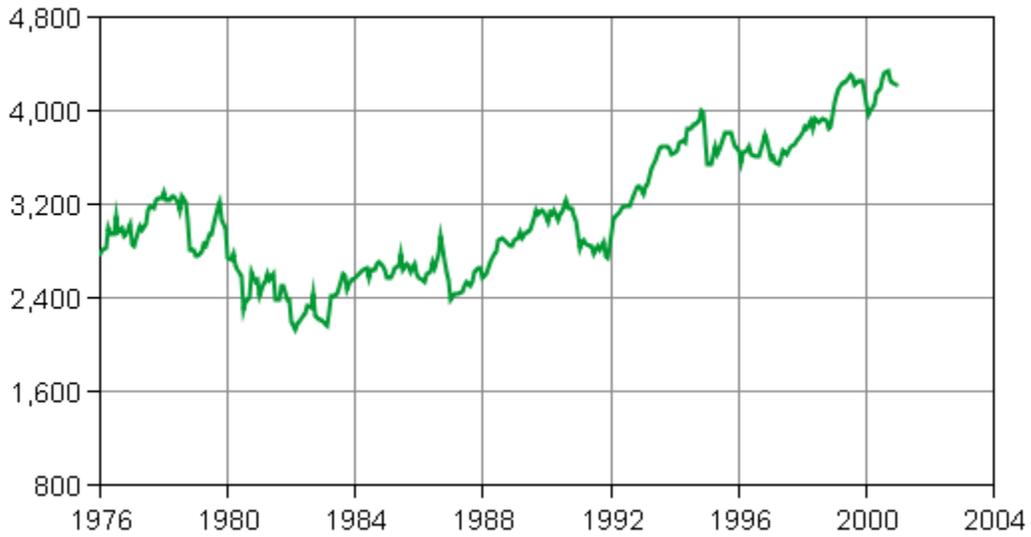
## State-wide Trends

In Oregon in the last 25 years, lumber and wood products employment (SIC 24) has been declining while employment in furniture and fixtures (SIC 25) has been increasing.

**Oregon Covered Employment**  
**Lumber And Wood Products (SIC 24, Private Ownership)**

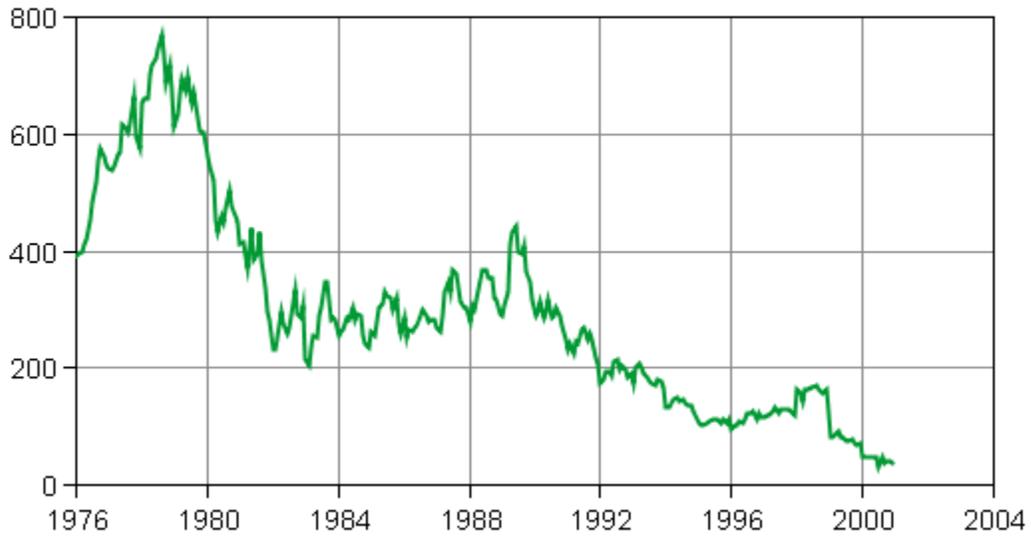


**Oregon Covered Employment**  
**Furniture And Fixtures (SIC 25, Private Ownership)**



State-wide, the following specific sectors have been decreasing over the last 25 years: special product sawmills (SIC 2429), softwood veneer and plywood (SIC 2436), and wood products, NEC (SIC 2499)

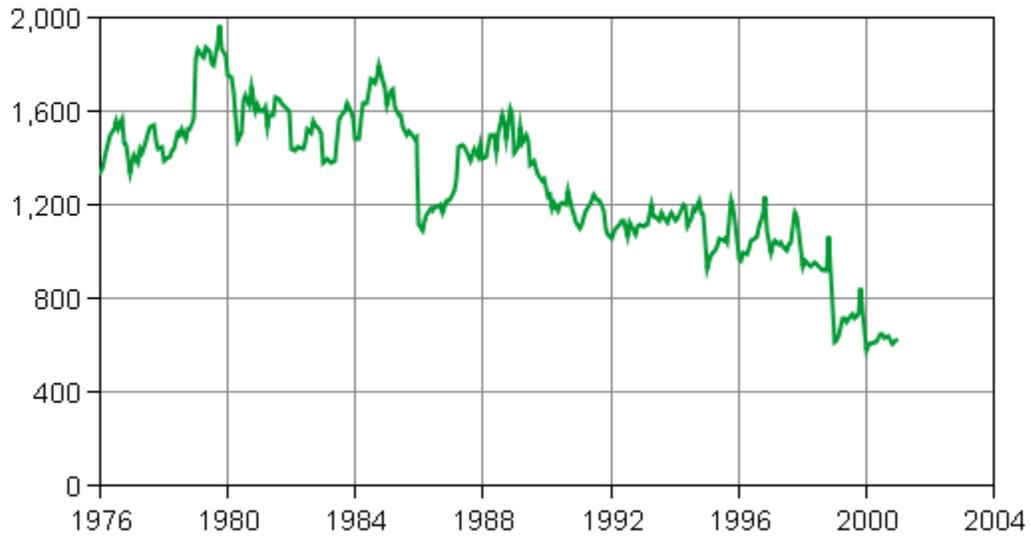
**Oregon Covered Employment**  
**Special Product Sawmills, Nec (SIC 2429, Private Ownership)**



**Oregon Covered Employment**  
**Softwood Veneer & Plywood (SIC 2436, Private Ownership)**

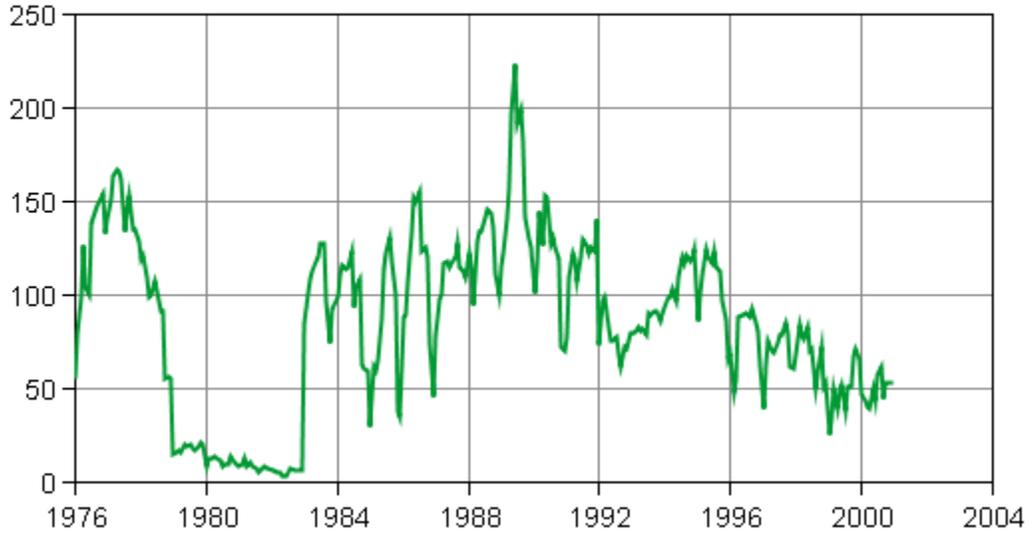


**Oregon Covered Employment**  
**Wood Products, Nec (SIC 2499, Private Ownership)**



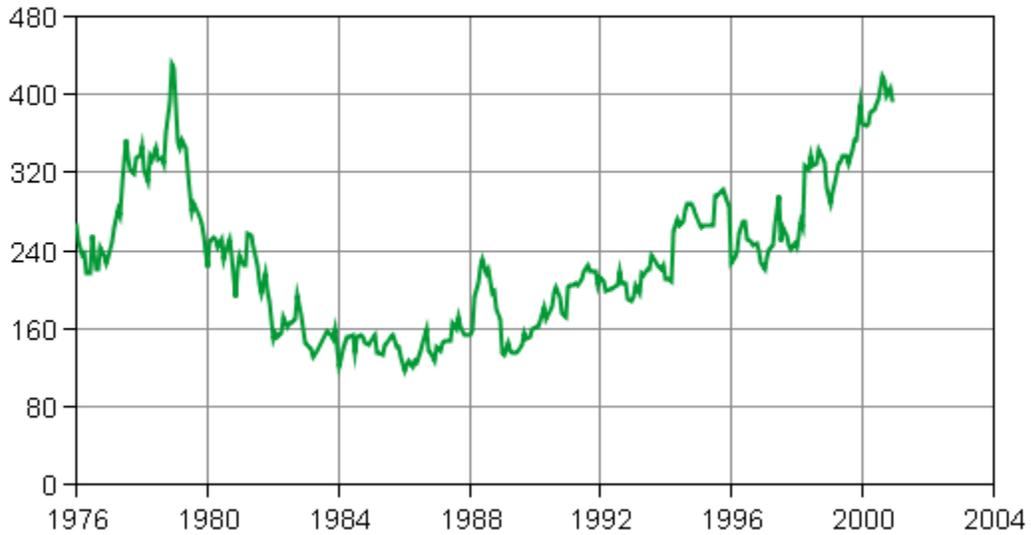
The nailed wood boxes & shook (SIC 2442) sector has behaved erratically, peaking in 1989, and showing a downward, yet erratic, trend since then.

**Oregon Covered Employment**  
**Nailed Wood Boxes & Shook (SIC 2441, Private Ownership)**



The following sectors show the most consistent upward trends: wood pallets and skids, wood partitions and fixtures, and structural wood members.

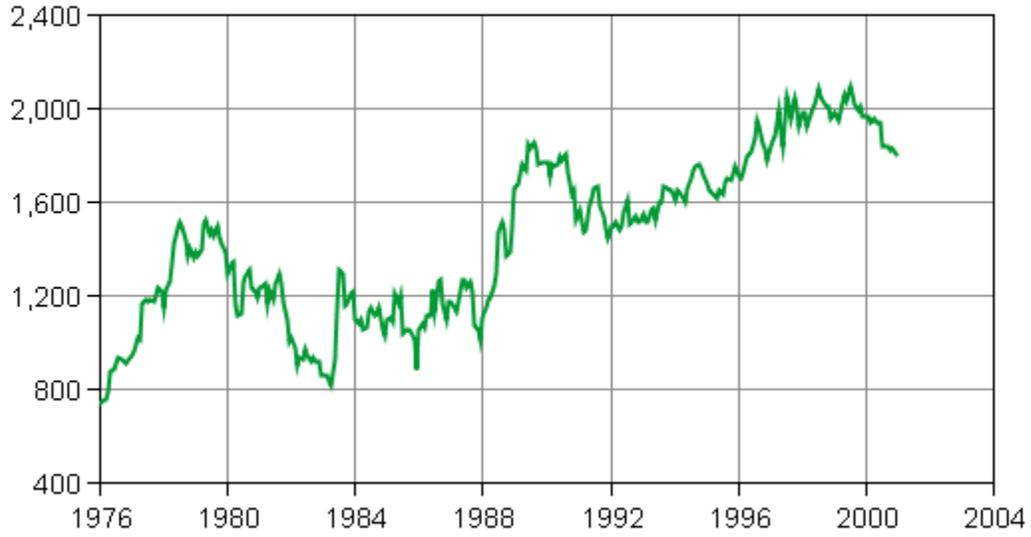
**Oregon Covered Employment**  
**Wood Pallets & Skids (SIC 2448, Private Ownership)**



**Oregon Covered Employment**  
**Wood Partitions & Fixtures (SIC 2541, Private Ownership)**

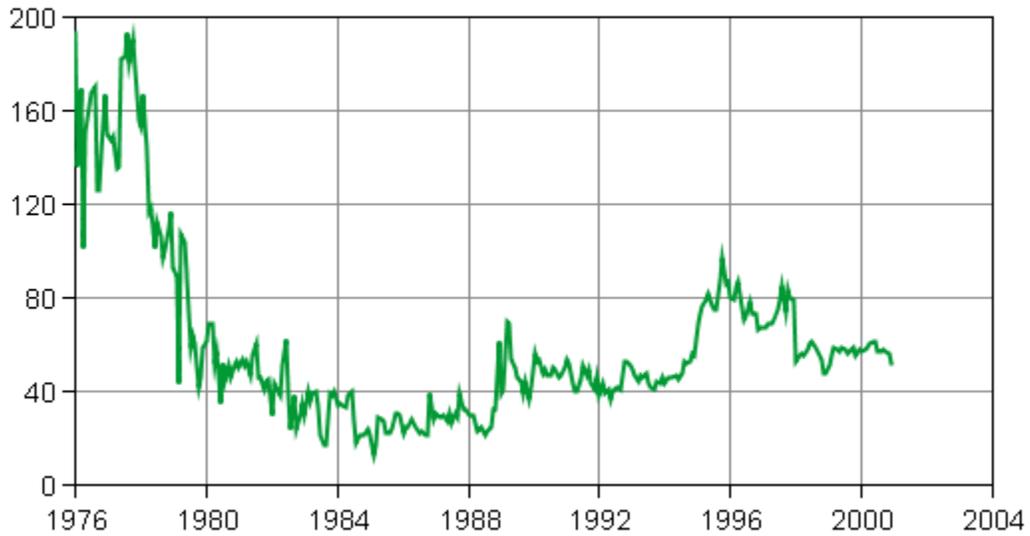


**Oregon Covered Employment**  
**Structural Wood Members, Nec (SIC 2439, Private Ownership)**



The following sectors have also shown upward trends in the last ten years: wood containers (SIC 2449), wood kitchen cabinets (SIC 2434), prefabricated wood buildings (SIC 2452), wood preserving (SIC 2491), and reconstituted wood products (SIC 2493).

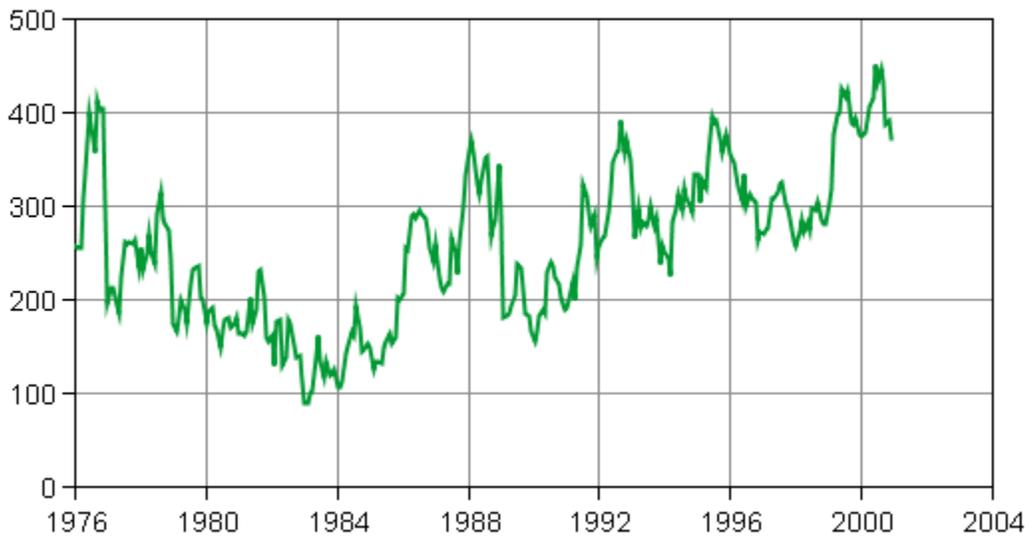
**Oregon Covered Employment**  
**Wood Containers, Nec (SIC 2449, Private Ownership)**



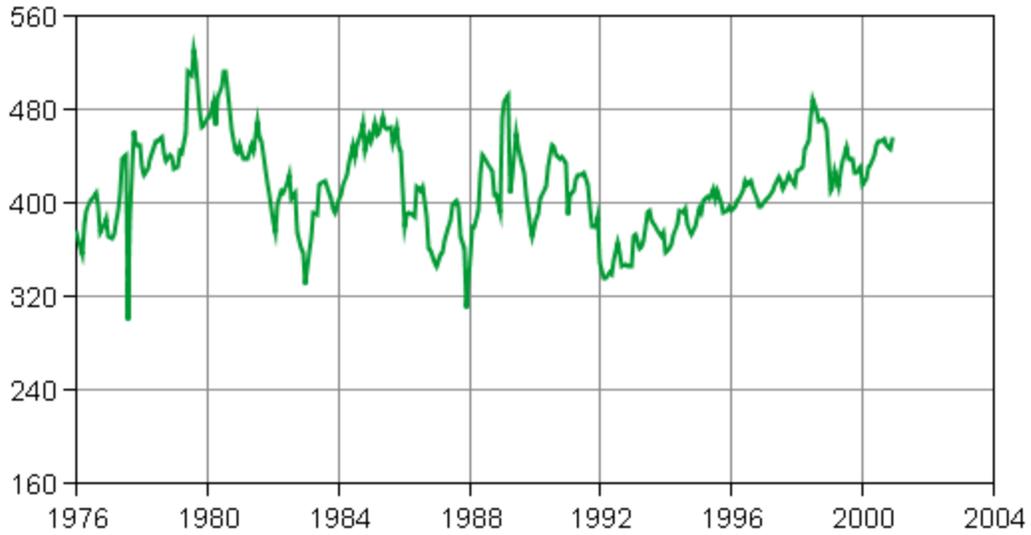
**Oregon Covered Employment**  
**Wood Kitchen Cabinets (SIC 2434, Private Ownership)**



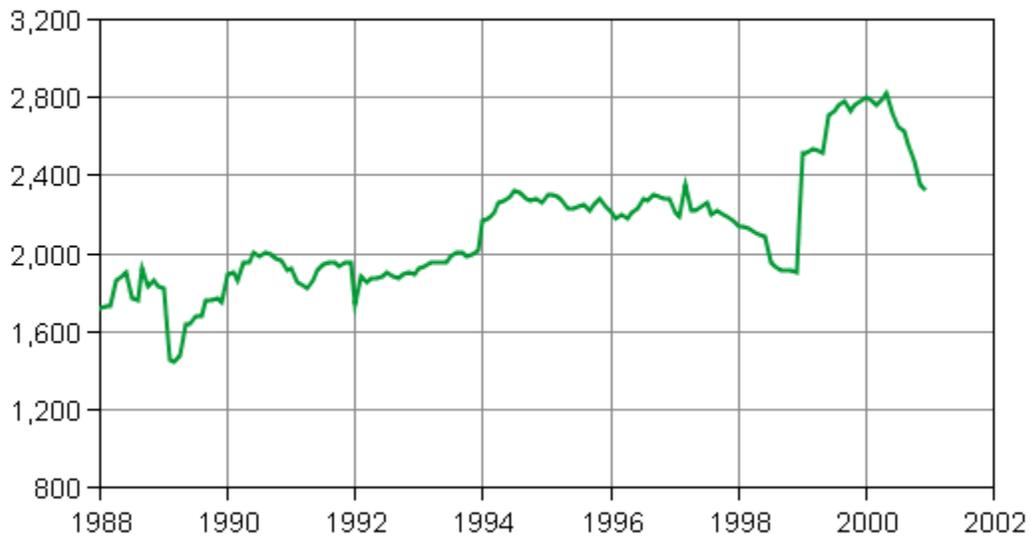
**Oregon Covered Employment**  
**Prefabricated Wood Buildings (SIC 2452, Private Ownership)**



**Oregon Covered Employment**  
**Wood Preserving (SIC 2491, Private Ownership)**

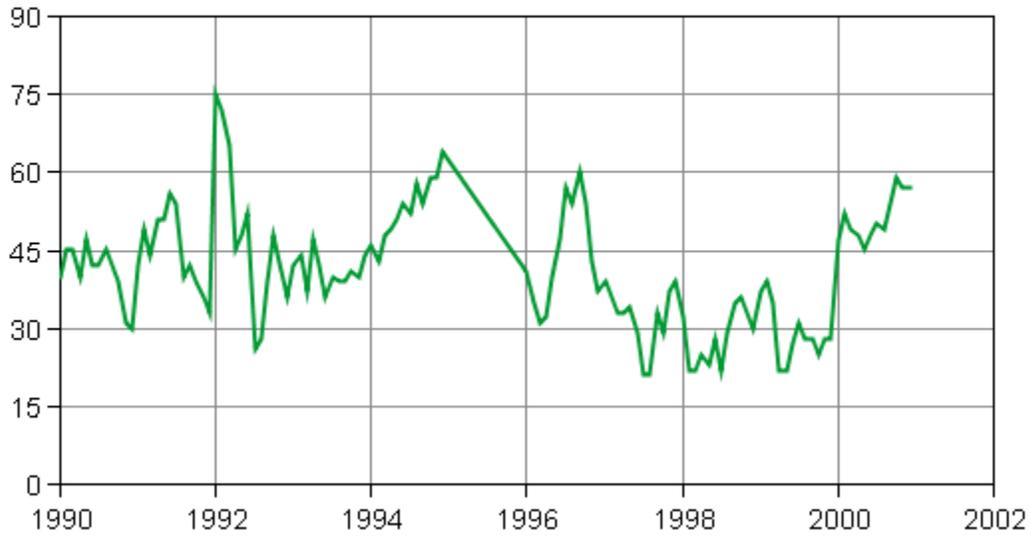


**Oregon Covered Employment**  
**Reconstituted Wood Products (SIC 2493, Private Ownership)**



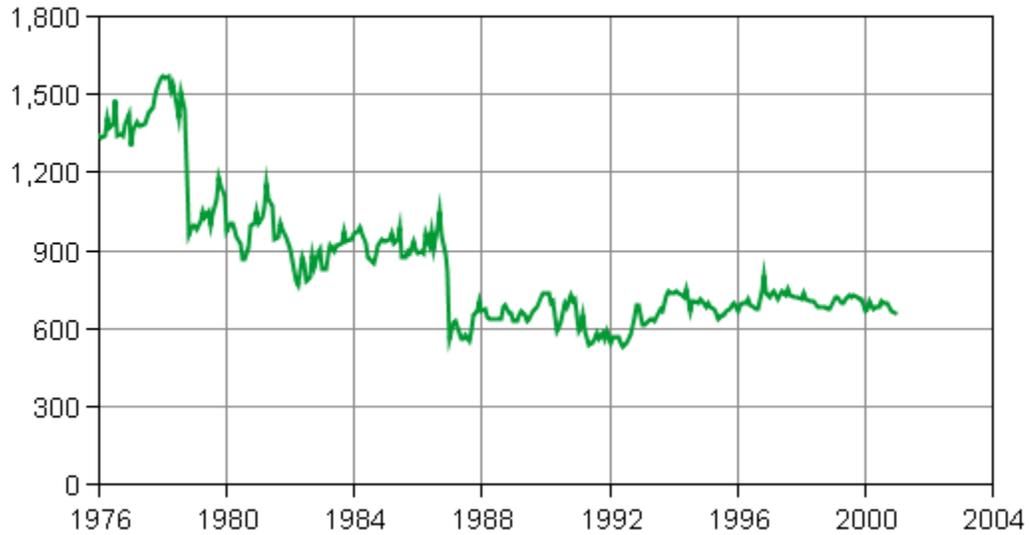
The wood TV & radio cabinets (SIC 2517) sector has behaved fairly erratically, but shows a drastic increase since 1999.

**Oregon Covered Employment**  
**Wood Tv & Radio Cabinets (SIC 2517, Private Ownership)**



The wood household furniture (SIC 2511) sector decreased until 1988 and has remained relatively constant since.

### **Oregon Covered Employment Wood Household Furniture (SIC 2511, Private Ownership)**

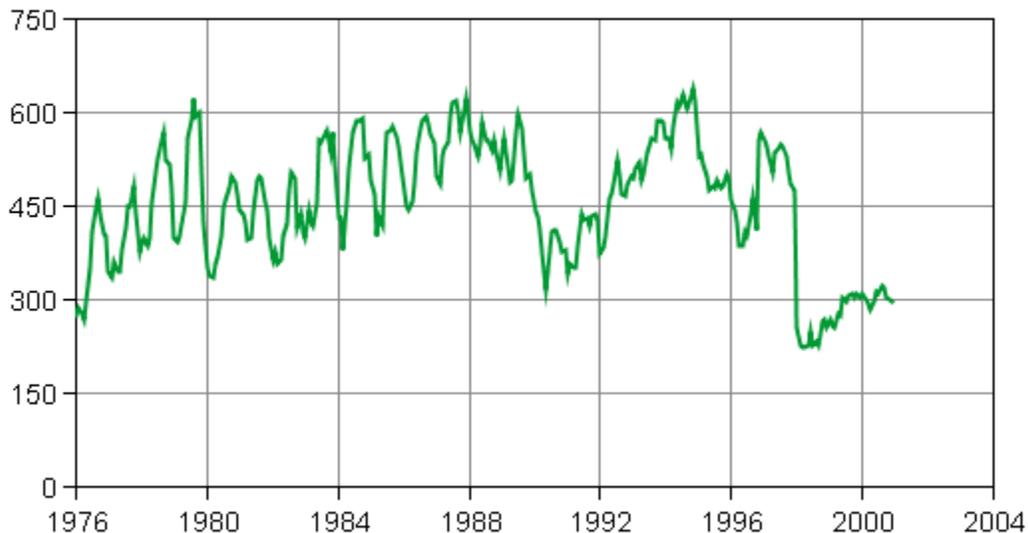


This data portrays some interesting trends in different secondary wood product sectors throughout the State. The following sectors are increasing: wood containers, wood kitchen cabinets, structural wood members, wood pallets and skids, prefabricated wood buildings, wood preserving, reconstituted wood products, wood TV and radio cabinets and wood partitions and fixtures. These trends lead directly to questions concerning *where* these changes are occurring. Are new opportunities in, for example, structural wood members, all occurring along the I-5 corridor? Are new opportunities directed to commodity markets or niche markets? Are the operations big or small? What are the opportunities for rural communities? More research is needed to answer these questions.

## County Trends

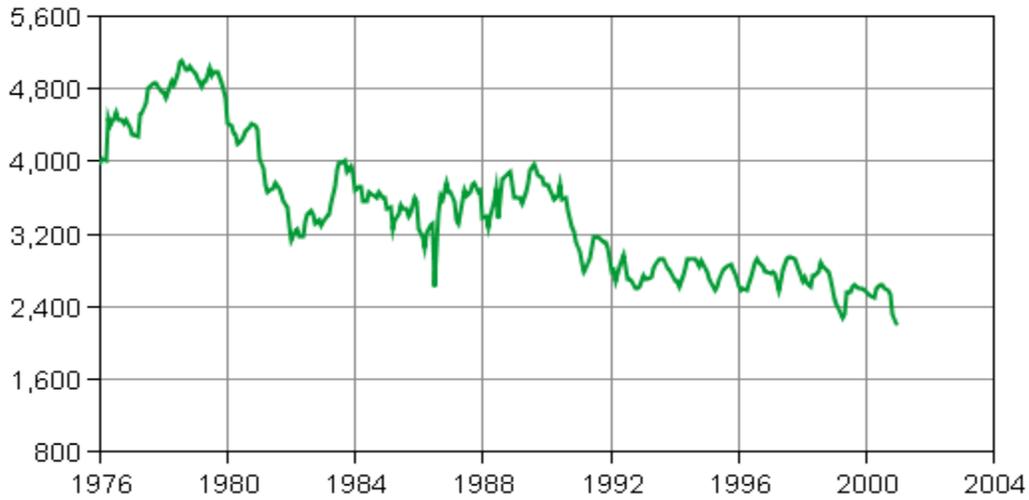
In Lake County, only SIC 24 data was available. Lumber and wood products as a whole declined precipitously in 1990, behaved erratically until 1997, when they plunged and have been slowly increasing since.

**Lake County Covered Employment**  
**Lumber And Wood Products (SIC 24, Private Ownership)**

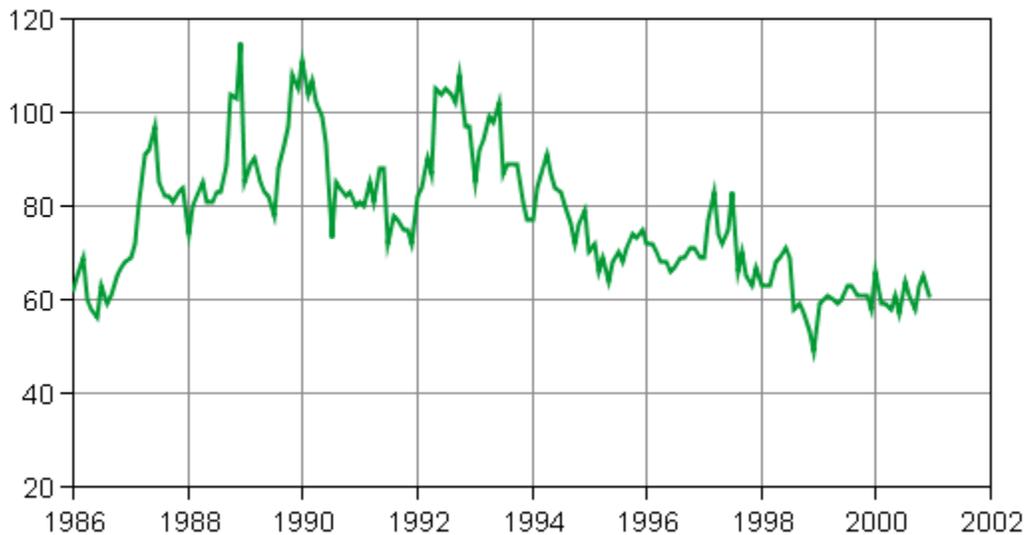


In Klamath County, SICs 24 and 25 show similar overall declining trends, both leveling out in recent years.

**Klamath County Covered Employment  
Lumber And Wood Products (SIC 24, Private Ownership)**

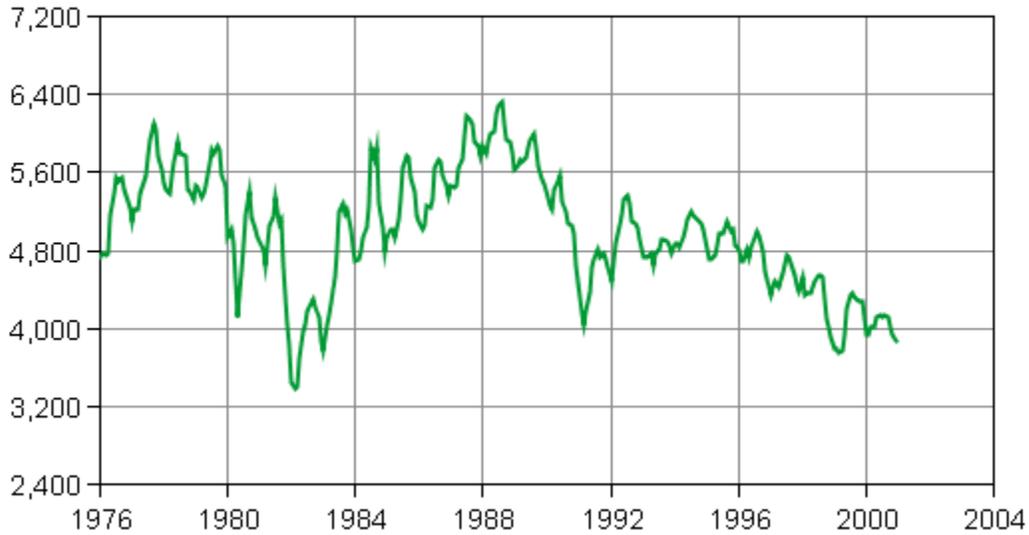


**Klamath County Covered Employment  
Furniture And Fixtures (SIC 25, Private Ownership)**

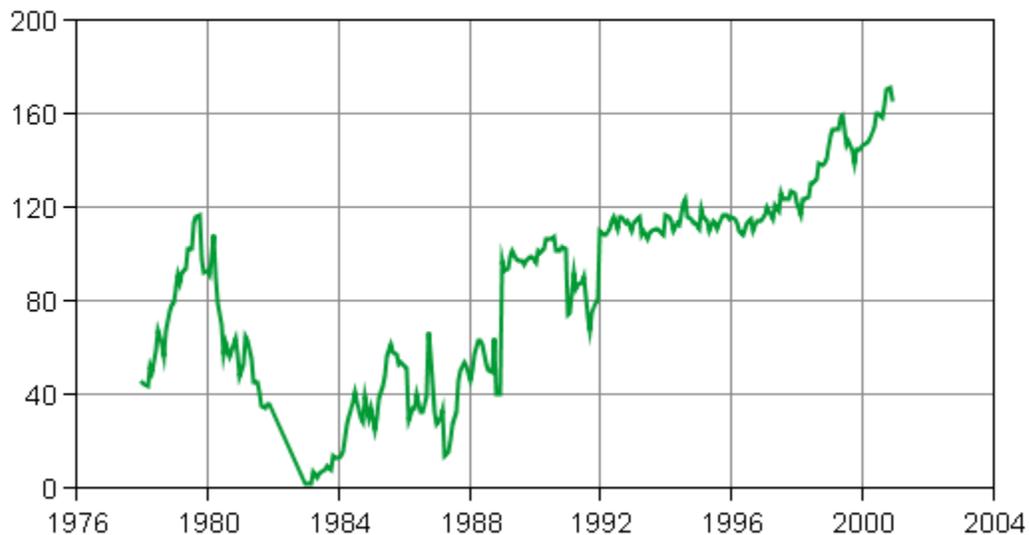


In Jackson County, lumber and wood products have declined since 1989, while furniture and fixtures have been increasing, markedly so in the last four years.

**Jackson County Covered Employment**  
**Lumber And Wood Products (SIC 24, Private Ownership)**

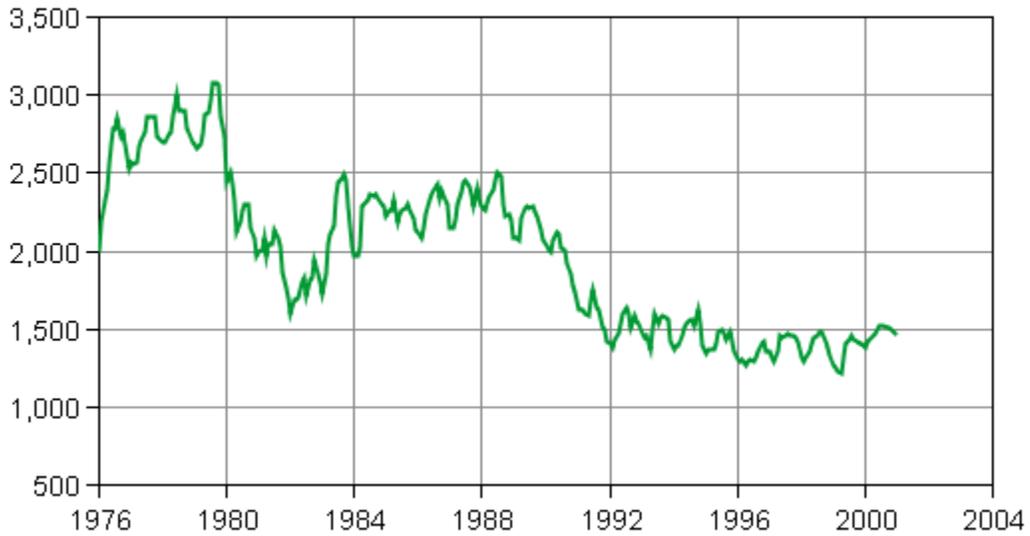


**Jackson County Covered Employment**  
**Furniture And Fixtures (SIC 25, Private Ownership)**

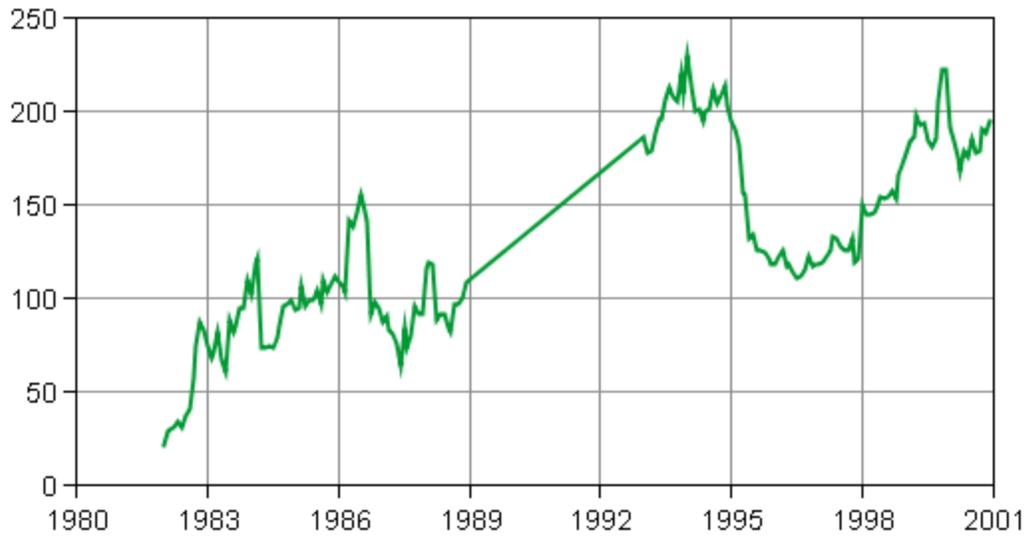


In Josephine County, lumber and wood products have declined since 1988, although since 1992 they show an almost constant undulation. Furniture and fixtures have been increasing in this time, expect for a serious decline in 1996.

**Josephine County Covered Employment  
Lumber And Wood Products (SIC 24, Private Ownership)**



## Josephine County Covered Employment Furniture And Fixtures (SIC 25, Private Ownership)



Overall, these four counties show very different trends in the wood products industry. While they have all experienced declines in SIC 24 (lumber and wood products), Jackson and Josephine Counties show significant increases in SIC 25 (furniture and fixtures). These trends beg the question of why? What is happening in Jackson and Josephine Counties that is not happening in Klamath County, and apparently is not happening in Lake County, according to a lack of reported data. More research needs to be done to understand specifically what is happening in the value-added industries in these counties. In a general way, SIC 24 reveals more about the primary wood industry, while SIC 25 reveals more about secondary wood products. SIC 24 does include many secondary products, yet the decline in the proportionately much larger primary sectors within SIC 24 probably masks the secondary products in the overall trends. SIC 25, on the other hand, contains many secondary wood products sectors, but also includes non-related sectors like metal furniture. More specific data will provide a more accurate picture of the value-added industries in these counties. At a first glance, however, it appears that Jackson and Josephine Counties have begun to exploit the potential in the secondary wood products industry, while Lake and Klamath Counties have not.

## **Marketing**

This section gives an overview of information from the literature review that is relevant for rural communities striving to match up production opportunities with market trends.

Williston (1991) outlines key elements for market analysis and planning in the value-added wood product industry:

- Where is the market located geographically?
- How big is the market?
- What share of the market can you hope to get?
- What price can your product command?
- What changes over time will affect the product life?
- What is the life expectancy of the product?
- Can the product be distributed through normal channels?
- Of the product is not distributed through your normal channels, how is it distributed and how do you adapt?
- Who are the principal competitors?
- What are their comparative advantages and disadvantages?
- Can you successfully compete from a manufacturing and marketing standpoint? If not, what changes would be required to make your organization competitive?

Reeb (date unknown) discusses the importance of finding an appropriate value-added niche, and compares two value-added operations in North Carolina and Kentucky, analyzing how they filled different niches based on their differing resources and locations. He also discusses the concept of a database project that would link up manufacturers and buyers within a region, and would provide technological and equipment information. He is currently working on the Alaskan Forest Products Database, which will be modeled on one created by the Michigan Department of Natural Resources ([www.dnr.state.mi.us/dnr/main.htm](http://www.dnr.state.mi.us/dnr/main.htm)).

Mater (2002) pinpoints four key elements that a specific region/town should keep in mind when looking at value-added opportunities: wood supply, infrastructure, process technologies, and location. These factors will best determine the most appropriate value-added operation, and will be key determinants for rural communities. She writes that manufacturers of new technologies are often interested in investing in targeted communities, based on resource stabilization and market due diligence. In other regions, companies have paid more than 50% of product testing costs. She suggests using a business plan to evaluate the potential for new technology, with the goal of reducing small log processing costs over existing production costs.

Mater also outlines some general market trends that may be helpful for planning purposes:

- Tariffs on Canadian softwood lumber (27%) have impacted \$6 billion worth of lumber flow into the US- this provides a unique opportunity for US lumber producers to recapture US commodity markets.
- Experts forecast favorable wood product markets in the US due to rebounding housing starts and the growth in the repair and remodel industry (due to low interest rates).
- Growth in specific wood product sectors may complement value-added initiatives
  - Kitchen cabinets; bathroom vanities (Sorbilite products): 15.5% sales increase over last year (report written July, 2002)
  - Wood component parts (Sorbilite, Indurite products): 7% sales increase last year; over 50% of buyers in the US plan to increase their component purchases.
  - Wood flooring (Indurite): growing with remodeling projects in US (70% of 2001 sales was for remodeling projects).
  - Moulding/millwork (Sorbilite): growing with remodeling projects in US.
  - Structural products (FRP): rapidly expanding; expected to grow by 500% between now and 2010.
  - ‘Enviro-friendly’ and certified wood products: market demand is growing substantially-especially within the home repair and remodel sectors.

Cohen and Goudie (1995) see opportunities for the Northwest to tap into the California furniture industry through niche markets most suitable for small, custom-

component producers willing to form relationships with existing segments of California's industry.

Further research on market opportunities is needed, specifically with regards to niche markets accessible to rural Oregon communities (Portland, San Francisco, Seattle...).

## **Questions for Further Research**

- Where are the secondary wood products operations that we see increasing in the general trends located?
  - Start with the list of known manufacturers.
  - If possible, use GIS to map this out.
  - What size are the operations?
  - Are they all along I-5?
- How can we get data on businesses not captured within standard industrial classifications?
- How can we get a more specific picture of the value-added industry within counties?
  - Counties must have some way of tracking sector-specific information.
  - Why are some counties exploiting value-added opportunities more than others?
- How can we best link rural producers with niche markets?

## Appendix

### Literature Reviewed

**Cox, Brian and Ian A. Munn. June 2001. A comparison of two input-output approaches for investigating regional economic impacts of the forest products industry in the Pacific Northwest and the South. Forest Products Journal. Vol. 51, No. 6.**

The authors used the IMPLAN system to perform an input-output analysis of forest-based industry contributions to regional economies of the South and the Pacific Northwest in the U.S. This method illustrates the difference between the standard “per dollar” approach of input-output modeling and a “per unit of output” approach. The authors suggest that examining incremental contributions to regional economies per unit changes in forest-based industry demand for timber on a per MMBF basis more accurately illustrates the effects of changes in national timber harvest policy. Findings are as follows:

- The total regional impact of the forest-based industry on the South’s economy is five times that of the Pacific Northwest.
- The industry’s impact, however, as a percentage of the regional economy is substantially higher in the PNW.
- With the exception of employment, the industry in the South has higher multipliers than the PNW.
- Incremental impacts to the PNW economy per MMBF change in the amount of timber delivered are greater than in the South.

**Cohen, David H. and Derek Goudie. June 1995. Profile of the California Furniture Industry: Structure, product types, and wood use. Forest Products Journal. Vol. 45, No. 6.**

This authors analyze a 1993 survey of California furniture manufacturers to profile this use of hardwood and softwood lumber.

- The industry is dominated by small, one-factory furniture plants with less than 20 employees.
- The vast majority of businesses were located near L.A. (72%) or San Francisco (23%).
- About three-quarters of the wood was hardwood, the remainder softwood. This is consistent with national averages.
- However, specific species use was drastically different than the national average, with the California industry using more alder and ponderosa pine.
- They also used twice as high a proportion of wood components and sub-assemblies as the national average.
- Market opportunities in the California furniture industry provide opportunities for value-added wood components from the Northwest, although the industry structure creates impediments due to lack of scale economies.
- Opportunities will tend to be the niche variety and most suitable for small, custom-component producers willing to commit the resources necessary to develop relationships with existing segments of California’s industry.

**Donoghue, Ellen M. and Richard W. Haynes. 2001. Comments on Criterion 6: Maintenance and Enhancement of Long-Term Multiple Socio-Economic Benefits to Meet the Needs**

**of Societies. Prepared for “A Landmark Assessment of Oregon’s Forest Sustainability,” Oregon Board of Forestry, Oregon State University College of Forestry.**

This report analyzes the relation of forest management to Criterion 6 in Oregon, focusing on production, consumption, employment, and community adaptability. The authors find that forest management has provided multiple benefits to meet societal needs and enhance long-term multiple socio-economic benefits, but this is hard to analyze and display as we lack indicators and output measures other than for timber. They include some recommendations to address this.

**Gebert, Krista, Charles Keegan, Sue Willits, and Al Chase. Utilization of Oregon’s Timber Harvest and Associated Direct Economic Effects, 1998. US Forest Service.**

With more than 16 million acres of commercial timberland, Oregon’s forest products industry is an important part of Oregon’s economy and a major player in the US wood products market. Despite declining production over the last decade, in 1998 Oregon was still the leading producer of softwood lumber and plywood in the US, and the timber harvested in Oregon is the major supplier of the raw material used in Oregon’s wood-processing mills. This report traces the flow of Oregon’s 1998 timber harvest through the various primary wood-using industries and investigates the relations between the harvest and key economic variables such as the value of production, employment, and worker’s earnings. Also included is a section on Oregon’s secondary wood products industry.

Oregon’s secondary wood products industry (value-added) generated around \$2.9 billion in sales, 23,000 jobs, and \$752 million in labor income. Firms manufacturing doors, windows, moulding, and cutstock generated the most sales revenue at \$701 million.

Total sales value of products made from 1998 timber harvest: \$4.2 billion, of which lumber products accounted for \$1.8 billion; plywood and veneer-\$1.2 billion; pulp, paper, and board products-\$1.2 billion, log exports-\$44 million and other primary wood products- \$17 million.

**Mater Engineering. July 2002. COPWRR Report Synopsis. Markets and Processing Options for Small Diameter Trees.**

- Focused on Crook, Deschutes and Jefferson counties.
- Compiled data on historical and current small diameter biomass volume and sales patterns in the region.
- Evaluated existing infrastructure in the region.
- Identified new smaller-scale process technologies
- Provided general markets overview that may impact small diameter product devt.
- Recommended economic framework for the region.
- Focused on small-diameter timber (5’’-9’’).
- Good framework of analyzing value-added opportunities in a specific region.

Key points to look at when applying this framework in a specific region

- **Wood Supply:** size, species, and consistency. Lack of consistency is the biggest challenge in this region, although the National Fire Plan may improve this. Recommendations include longer term (3-5 year) resource planning protocols for sales and fuel reduction projects, and determining resource characteristics coming from NFP treated acres (dbh, species)

- **Infrastructure:** look at the existence of mills- large and small-diameter. Evaluate possibility of new, efficient, high-speed small log processing options. Are new industrial sites required, and can the region accommodate this investment?
- **Processing Technologies:** Work backwards- size the technology to fit the forest.

#### Technologies to consider

- High-speed, single-pass, small log processing
- Wood glulam beams made with fiber-reinforced polymer (FRP)
- New high-compression molding system using wood residual (Sorbilite)
- New lumber hardening process (Indurite)
- New lumber stress grading technology (E-Grader)

**Meyer, Christopher, Judd H. Michael and Steven A. Sinclair. March 1992. The U.S. wood furniture industry: a profile of products and channels of distribution. Forest Products Journal. Vol. 42, No. 3.**

The authors surveyed 347 wood household furniture manufacturers (SIC 2511) to profile the variety of products produced and channels of distribution used. Bedroom, dining room, and occasional furniture were produced by greater than 50% of the respondents. 47% manufactured living room furniture and entertainment centers. Solid hardwood furniture was the most frequently produced type among seven common types of construction. The largest volume of sales (29.8%) were through traditional free-standing furniture stores. Over 60% of sales were handled by manufacturers' representatives.

**Raettig, Terry L. and Harriet H. Christensen. Timber Harvesting, Processing, and Employment in the Northwest Economic Adjustment Initiative Region: Changes and Economic Assistance.**

This report details the Northwest economic adjustment initiative (NWEAI), which was designed to coordinate and manage Federal economic assistance efforts to offset economic consequences of a declining timber harvest in the Northwest. Their conclusions summarize the declines in timber harvest and employment in the Northwest, highlights the role of the secondary forest products industry in off-setting some of the decline in employment, and points out important differences in the patterns of timber harvest decline and employment losses in the region. As expected, counties that are more dependent on public timber supplies have experienced the most severe impacts.

**Reeb, Jim. A Northwest Perspective on Secondary Processing. Oregon State University.**

Reeb provides a good comparison of primary and secondary processing attributes in general (see table). He then compares two value-added operations in North Carolina and Kentucky to highlight the importance of finding an appropriate value-added niche based on location and available resources. He summarizes Oregon State University's transition to focusing more energy in the value-added industry in response to simultaneous decline in the primary sector and growth in the employment sector. OSU has recently hired two value-added faculty and two value-added extension staff. He wraps up by introducing

the Alaskan Forest Products Database project- an effort to connect all the information in a region over the internet to link manufacturers and buyers, and make technology, equipment, and

information available. This is modeled on an example from the State of Michigan Department of Natural Resources: [www.dnr.state.mi.us/dnr/main.htm](http://www.dnr.state.mi.us/dnr/main.htm)

Table: Comparing general attributes of commodity and value-added producers

<b>Commodity producers</b>	<b>Value-added producers</b>
Located close to available raw material	Located close to the final consumer
Steady and large volume of raw material	Less volume of wood needed
Highest variable cost is the raw material	Wood is only one of several material costs
Little or no influence on price, so controlling costs is very important	Low production costs are not as important- high quality and the ability to differentiate the product from competitors very impt.
Low cost implies high conversion efficiencies- a lot of product, little waste	Efficient conversion not critical, but still impt. Produces more dry wood waste.
Highly automated	Labor intensive
Can only do a few things to differentiate product from competition	The ability to differentiate product is very important
Little value is gained from advertising product you cannot differentiate.	Advertising becomes very important
Infrastructure is very impt (labor, equipment)	Infrastructure is also very impt (labor, equipment, technical expertise)

(Compiled from Reeb)

**U.S. Forest Service. December 2000. Forest Products Laboratory Research Program on Small-Diameter Material.**

Details the different processes and opportunities in using small-diameter wood through descriptions of thirty different projects throughout the state. Includes a regional index of these projects.

**Warren, Debra D. 2002. Harvest, Employment, Exports, and Prices in Pacific Northwest Forests, 1965-2000. US Forest Service, Pacific Northwest Research Station.**

This document consists of tables showing harvest, employment, exports, and price data for each year from 1965-2000. Great source for statistics and making tables.

**Williston, Ed M. 1991. Value-Added Wood Products: manufacturing and marketing strategies. New York: Miller Freeman, Inc.**

This book focuses on manufacturing and marketing strategies for the value-added wood products industry. Particularly useful is a chapter on market analysis and planning that provides a good (if general) framework to work with. The book is very practical-oriented, and contain some guidelines for training and motivation.