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Timber Harvesting, Processing, and Employment in the Northwest Economic Adjustment Initiative Region: Changes and Economic Assistance

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Abstract

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The Northwest economic adjustment initiative (NWEAI) provides economic assistance to a region including western Washington, western Oregon, and northern California. Timber harvests have fallen markedly in this region since 1990. The forest products industry is the largest manufacturing sector in the region, and employment has followed the downward trend in timber harvest. There are important differences in the declines in timber harvest, employment, and the importance of the forest products industry at the county level. The NWEAI is a significant initiative designed to coordinate and manage Federal economic assistance efforts in the region.

Keywords: Timber harvest, employment, economic assistance, Northwest Economic Adjustment Initiative.

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Introduction

The Northwest Forest Plan, released on July 1, 1993, was a response to continuing problems in public land management in the Pacific Northwest (Christensen and others 1995). Court actions, policy changes, and controversy brought the timber sale programs of the USDA-Forest Service and the Bureau of Land Management, the two largest Federal land management agencies in the region, to a standstill by 1991. The Northwest Forest Plan addresses three primary issues: forest management, economic development, and agency coordination (Tuchmann and others 1996).

The Northwest economic adjustment initiative (NWEAI) is the economic development component of the Northwest Forest Plan. The Northwest Forest Plan includes the NWEAI because of the recognition that the natural resource policy changes in the Pacific Northwest have significant social and economic impacts (Clinton and Gore 1993). The NWEAI was designed to provide for the immediate needs of workers and families as a result of reduced timber harvest and to address longer term community development issues. An understanding of the changes in natural resource availability and the impact on those industries dependent on processing the natural resources is a prerequisite for understanding the broader social and economic well-being trends in the NWEAI region. The understanding of natural resource availability also aids in determining the effects of the efforts to mitigate the impacts and dislocations resulting from natural resource policy changes. When the potential policy changes were being considered, substantial controversy was generated over the magnitude, location, and timing of potential timber harvest reductions and employment impacts in the forest products industry (Raettig and McGinnis 1996). This analysis examines the impacts that have actually occurred in the NWEAI region in the short term as the Northwest Forest Plan has been implemented.

The Region Defined

The Northwest Forest Plan addresses ecosystem management in a region that includes parts of California, Oregon, and Washington. The region is centered on the range of the northern spotted owl (*Strix occidentalis caurina)* but includes adjacent ecologically similar areas outside the range (Tuchmann and others 1996). The NWEAI region is made up of counties determined by each state to be eligible for economic assistance from the NWEAI (fig. 1). The 52 counties that define the NWEAI region include most of the counties in the Northwest Forest Plan region but exclude a few counties in the Puget Sound area and Portland metropolitan area and include a number of counties outside the range of the northern spotted owl where adverse economic impacts from timber harvest reductions were expected.

Timber Harvesting and Processing Trends

Timber harvests in the Pacific Northwest and the United States have varied historically in a pattern coincident with national business cycles. The patterns for harvesting have been relatively low in recessionary periods and high in periods of economic expansion in the national economy. Timber harvests for California, Oregon, and Washington since 1978 (fig. 2) clearly reflect the impact of the severe recession of the early 1980s. Also evident is the economic downturn of the early 1990s, and it is in this period that the harvest trends in the Pacific Northwest diverged from national trends.

Nationally, softwood timber harvests were at their lowest point for the 1990s in 1991 and then started increasing and were near prerecession levels by 1995. In sharp contrast, timber harvest in the Pacific Northwest continued to fall for 3 more years before stabilizing in 1994 to 1996. This diverging trend in timber harvests is reflected in changes in market share for the Pacific Northwest. In 1980, the Pacific Northwest west

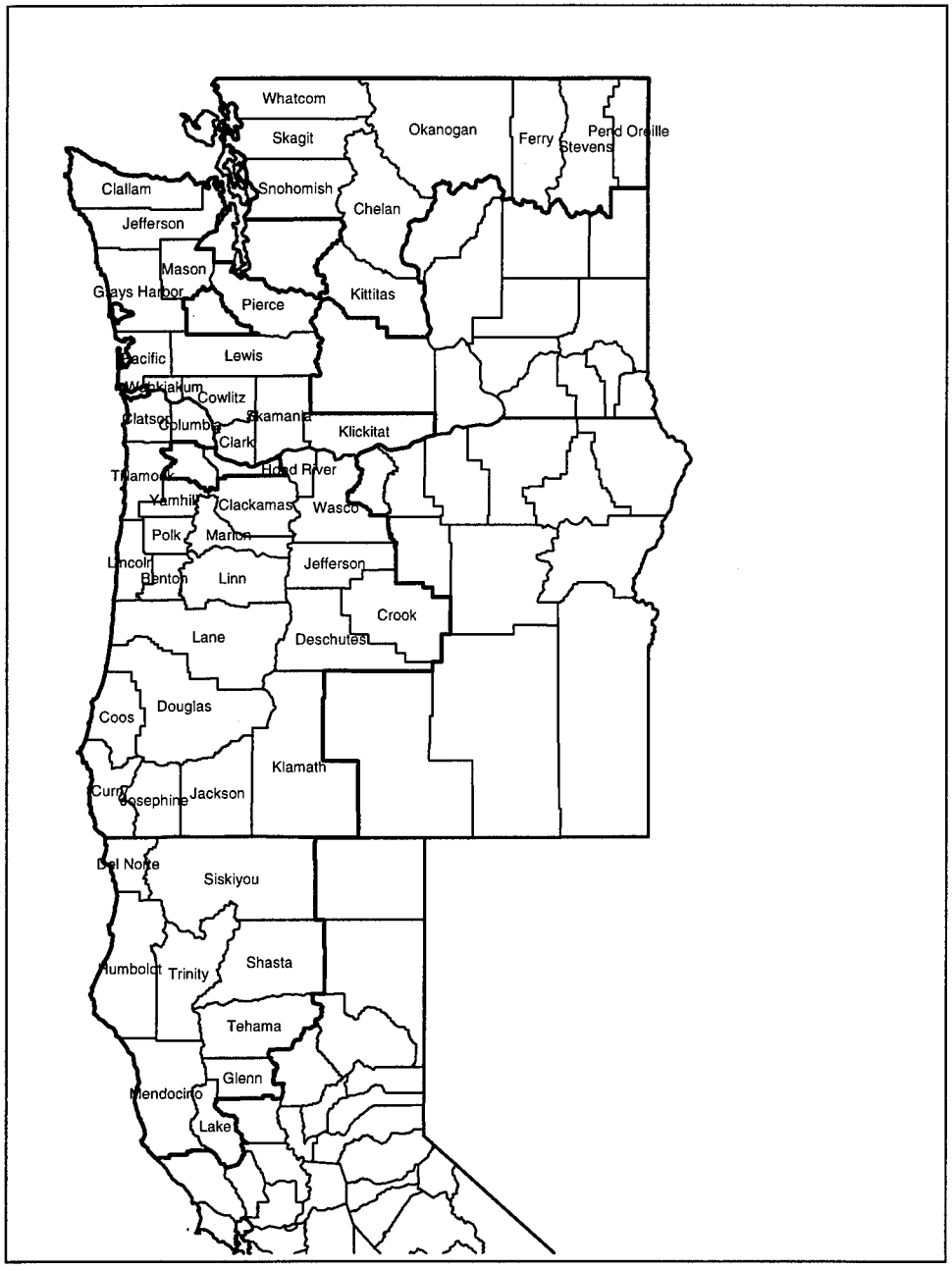


Figure 1—The Northwest economic adjustment initiative region.

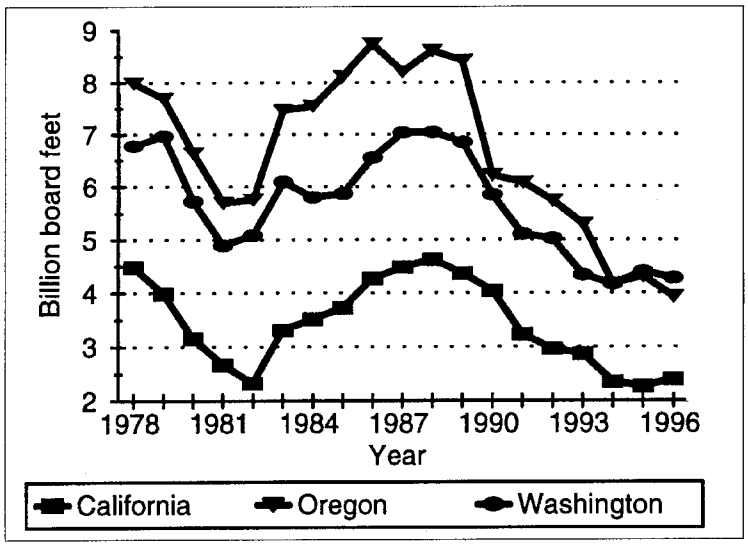


Figure 2—Total timber harvest for California, Oregon, and Washington, 1978 through 1996.

of the Cascade Range provided 25 percent of the total softwood harvest in the United States; in 1989, the Pacific Northwest west side provided 26 percent of the national softwood harvest, but by 1995 the region's harvest had declined to only 17 percent of the national total.

The reductions in timber harvest in the Pacific Northwest and the NWEAI region that have occurred because of changing natural resource policies have had a profound impact on the forest products industry and those economies dependent on the industry. Although the timber harvest has decreased across the entire NWEAI region, there have been differences in the magnitude and impact of the reductions by ownership and by county (Christensen and Raettig 1997).

Harvests from both public lands[1] and private lands have decreased in all three states (table 1), but the decreases have been far more significant on public lands. For all counties in the NWEAI, the percentage of decrease in timber harvest from public lands between 1989 and 1994 is 80 percent. These years serve as useful comparison years to determine the impact of the policy and management changes, because 1989 predates most of the policy changes and resulting harvest impacts, and by 1994 most of the impacts from the changes and recovery from the national recession had occurred. Preliminary harvest data for 1995 and 1996 indicate that the harvest in the NWEAI region is no longer decreasing and may have stabilized.

The harvest from private lands is a contrast to the harvest from public lands in that the decrease for private lands in the region between 1989 and 1994 is less than 25 percent and was only 15 percent in Oregon. Decreases in harvests from private lands may reflect a number of factors, including inventory and age class constraints, and restrictions on private harvests as a result of changing public policies. Oregon counties in the NWEAI region have been particularly dependent on harvests from public lands, and the

[1] Harvests from public lands include harvests from lands owned by Federal, tribal, state, and local government entities.

Table 1—Timber harvest changes in the NWEAI region between 1989 and 1994

State and ownership	1989 harvest	1994 harvest	Decrease
	---- Thousand board feet ----		*Percent*
California:			
Private	1,739,725	1,240,907	-28.7
Public	738,002	93,866	-87.3
Total	2,477,727	1,334,773	-46.1
Oregon:			
Private	3,329,772	2,834,066	-14.9
Public	3,862,062	648,673	-83.2
Total	7,191,834	3,482,739	-51.6
Washington:			
Private	4,027,278	2,965,848	-26.4
Public	1,929,039	592,045	-69.3
Total	5,956,317	3,557,893	-40.3
NWEAI region:			
Private	9,096,775	7,040,821	-22.6
Public	6,529,103	1,334,584	-79.6
Total	15,625,878	8,375,405	-46.4

total impact of timber harvest changes on the forest products industry would have been even greater without the relatively small decrease in private harvests. For the entire NWEAI region, the decrease in timber harvest between 1989 and 1994 was just under 50 percent.

Most of the harvest from private lands in the region comes from second-growth stands. By 1994, 91 percent of the timber harvest in western Washington was considered young growth (Larsen 1996). This lack of old-growth inventory and dependence on second-growth stands limit the ability of private owners to increase harvests to compensate for declining timber harvests from Federal lands. To the extent that private owners increase harvest from immature stands in response to increasing prices, the potential for future revenues also may be compromised.

When individual counties within the region are considered, there is large variation in the decrease in total timber harvest (fig. 3).[2] The decrease is over 75 percent in Hood River County, Oregon, and Glenn County, California; 13 of the 52 counties in the region have decreases in total harvest exceeding 60 percent for the period. The counties having the largest percentage of decrease are clustered on the east side of the Cascade crest near the Columbia Gorge and in southern Oregon and interior northern California. These counties tend to have had a high proportion of their timber harvest originate on

[2] Figures 3 to 5 were developed from data compiled for: Christensen, Harriet H.; McGinnis, Wendy J.; Raettig, Terry L.; Donoghue, Ellen. Atlas of human adaptation to environmental change, challenges and opportunities: northern California and western Oregon and Washington. Manuscript in preparation.

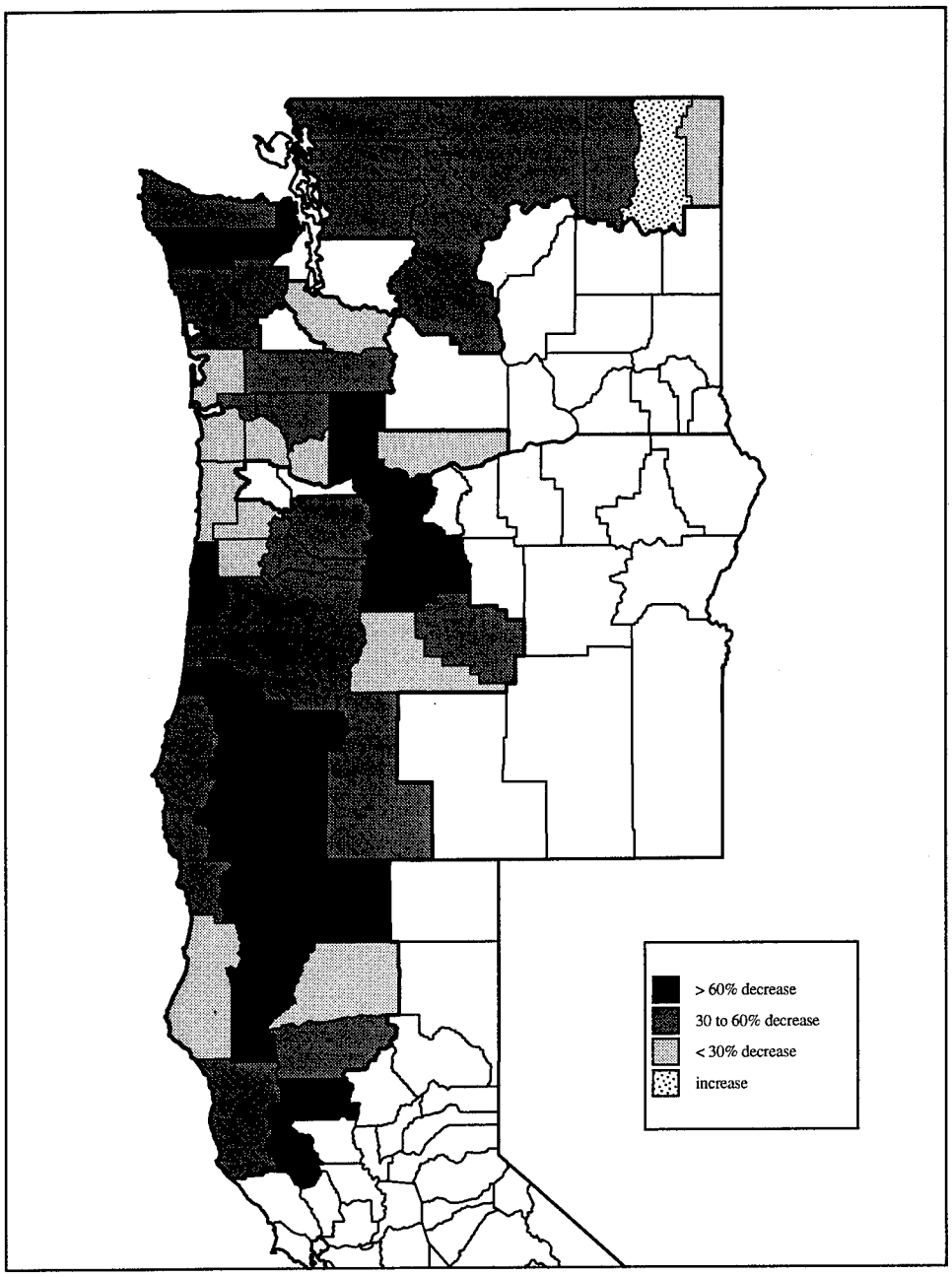


Figure 3—Percentage of change in timber harvest in the NWEAI region between 1989 and 1994.

public lands and are relatively distant from urban centers in the region. At the other end of the scale, Stevens County, Washington, had an increase in total timber harvest between 1989 and 1994 because of the strong increase in the private harvest in that county. Thirteen other counties in the region had less than a 30-percent decrease in timber harvest for the period.

Those counties with the largest percentages of decrease in timber harvest usually are those having the greatest proportionate loss of logging jobs, but not necessarily the greatest loss of lumber and wood products manufacturing jobs. The nature and location of the forest products processing facilities and log flows ultimately help determine the total impact of the harvest reductions on the local and regional economy. Mill surveys have traditionally provided the most comprehensive information on the forest products industry and raw material flows in the Pacific Northwest (Howard and Ward 1991, Larsen 1992, Ward 1997). Mill survey data from 1988 and 1994 provide industry information for the period when the most significant harvest reductions occurred in the NWEAI region.

There are noticeable differences in the use of roundwood in the three states included in the NWEAI region. Statewide data (table 2) indicate that most roundwood processed in California is used by the sawmill industry with a much smaller amount used by the veneer and plywood industry. Other end uses of roundwood in California are insignificant. In contrast, the sawmill industry in Oregon still accounts for the largest proportion of roundwood used, but the veneer and plywood industry is also a major consumer, and log exports are locally important. Washington presents yet another pattern of roundwood use with sawmills accounting for less than one-half of the total roundwood harvested in 1988. Log exports are much more significant in Washington than in the other two states and account for almost as much roundwood consumption as the sawmill industry. The veneer and plywood industry is locally important in Washington, but the total amount of timber processed by the industry in Washington is not large.

The pulp and paper industry across the region relies mainly on residue from roundwood processing plants and, as such, is very important in the overall profitability of the sawmill and plywood sectors of the industry. The pulp and paper industry directly processes less than 10 percent of the total roundwood harvest in each of the three states.

Patterns of use by industry are important because some industries such as the log export industry add less value to the raw material and have a smaller employment impact on the local and regional economy. Other industries, such as the pulp industry and the veneer and plywood industry, produce products with higher value added and provide proportionately more jobs for the local economy. It is not possible to provide consistent data on patterns of log use and the industry by county, because many counties have only one or a few forest products processing firms and disclosure of industry statistics for such counties would violate the confidentiality assurances that are part of the mill surveys. Data for selected counties can be used, however, to show the changes in raw material use in the region.

In northern California, the volume of logs processed fell from 2.5 billion board feet in 1988 to 1.2 billion board feet in 1994.[3] But this reduction of more than 50 percent is not shared equally across the northern California counties. Humboldt County, for instance,

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[3] The California, Oregon, and Washington counties included approximate those included in the NWEAI region but do not correspond exactly because some county data are combined to avoid disclosure.

Table 2—Pacific Northwest roundwood consumption for 1988 and 1994, by state and industry

(volume in thousand board feet)

Industry	Washington[a]		Oregon		California	
	Volume	Percent	Volume	Percent	Volume	Percent
			1988			
Sawmills	3,014,835	43	5,447,497	62	3,830,709	93
Log export	2,847,389	41	673,592	8	56,892	1
Pulp	540,057	8	101,458	1	46,899	1
Veneer and plywood	457,339	7	2,529,588	29	195,756	5
Shake and shingle	61,792	1	15,724	–	1,386	–
Posts and poles	22,768	–	30,551	–	10,849	–
Total	6,944,180	100	8,798,410	100	4,142,491	100
			1994			
Sawmills			2,631,591	68	2,228,336	93
Log export			219,027	6	2,700	–
Pulp			80,614	2	–	–
Veneer and plywood			892,907	23	124,538	5
Shake and shingle			4,607	–	350	–
Posts and poles			26,992	1	41,489	2
Total			3,855,738	100	2,397,413	100

[a] Data for 1994 for Washington are not available.

Source: Data for Washington are from Larsen (1992). Data for Oregon and California are from Howard and Ward (1991) and Ward (1997).

processed 891 million board feet of roundwood in 1988 and 692 million board feet in 1994, and the number of operating sawmills fell only from 16 to 15. In contrast, Mendocino County experienced a decrease in roundwood processed from 466 million board feet in 1988 to 31 million board feet in 1994 and a decrease in the number of operating sawmills from 10 to 7. For all the northern California counties in the NWEAI region, the number of operating sawmills fell from 48 in 1988 to 31 in 1994.

The quantity of logs processed in the NWEAI region in Oregon fell more precipitously from 7.9 billion board feet in 1988 to 3.2 billion board feet in 1994, a 60-percent drop. Again, the reduction in volume processed differed from county to county. Two counties severely impacted were Douglas County with a reduction in volume processed from 1.2 billion board feet in 1988 to 361 million board feet in 1994 and Jackson County with a reduction from 723 million board feet in 1988 to 187 million board feet in 1994. In contrast, the reduction in volume processed in Lane County was less than 50 percent, and the volume processed in Tillamook County actually increased in the period. The number of operating sawmills in the NWEAI counties in Oregon decreased from 135 in 1988 to 80 in 1994.

Data from the 1994 mill survey were collected in Washington but have not been summarized (and may not be summarized because of budget priorities), so changes in roundwood processing that occurred during the period of timber harvest declines cannot be displayed. Other data suggest that the volume of log exports from Washington

may be declining faster than the decline in harvests (Warren 1996). Between 1989 and 1994, the volume of log exports from the Seattle Customs District fell by 62 percent compared with a timber harvest decrease of 40 percent in the same period.[4] In the absence of large new investments in veneer or pulp mills, this would increase the proportion of the Washington timber harvest being processed in sawmills.

Employment in the Forest Products Industry

Changes in timber industry employment, the employment in Standard Industrial Classification (SIC) sector 24, reflect the impact of harvest reductions on both the harvesting (logging) and processing parts of the solid-wood forest products industry. Primary pulp and paper manufacturing and secondary paper processing employment is in SIC 26. The SIC 24 employment changes examined in this section are reported by state employment offices in the three states. These data represent the only comprehensive employment information for SIC 24 available at the county level. It is a less inclusive measure of employment than some other measures such as the U.S. Department of Commerce, Bureau of Economic Analysis, employment data, because only "covered employment" is reported and some classes of employees, such as proprietors, are excluded. Only employees covered by unemployment insurance legislation are reported under "covered employment."

Employment in the forest products industry (SIC 24) in the NWEAI region fell by just under 14,000 jobs between 1990 and 1994 (table 3). This does not represent the total decrease in forest products industry employment in the Pacific Northwest as a result of timber harvest decreases, because counties in eastern Oregon and Washington, northern California, and a number of metropolitan areas in the Pacific Northwest are not included in the NWEAI region. Also, SIC 24 does not include employment in the pulp and paper industry. Some of these counties excluded under NWEAI (King and Thurston in Washington, Washington and Multnomah in Oregon) have forest products harvesting and processing firms impacted by the harvest decreases. Conversely, the SIC 24 sector includes industries that do not process locally harvested timber, and employment changes in these industries are not related to local forest management policy changes. For comparison, changes in forest products industry employment also are shown for each entire state in the Pacific Northwest (table 3). Changes in forest management policies have occurred outside the NWEAI region, and the decrease in SIC 24 employment in California has been greater outside of the NWEAI region than within the region. There is also the potential impact of broad-scale economic changes, business cycles, and technological changes on SIC 24 employment. All these complex interactions mean that the employment changes in the forest products industry are, at best, an indication of impacts from harvest reduction, and losses are not due solely to reduced timber harvest.

The decreases in forest products employment in the NWEAI region are much smaller proportionally than the decreases in timber harvest. In part, this is because some of the industries included in SIC 24 are not dependent on locally harvested timber. Wood buildings and mobile homes ("manufactured housing") are examples of industries included in SIC 24 that do not depend exclusively on locally harvested timber. These secondary industries tend to be located close to markets and are more responsive to growth in the market area and changes in local economies rather than to raw material

[4] A large share of the log exports from Washington timberlands moves through the Seattle Customs District. Additional timber from Washington is exported through the Snake-Columbia Customs District, which experienced similar decreases in exports for the period.

Table 3—Employment and change in SIC 24 between 1990 and 1994 in the Pacific Northwest

State	1990 employment	1994 employment	Decrease
	Employees		*Percent*
	NWEAI counties only		
California	12,981	10,939	-15.7
Oregon	55,387	46,648	-15.8
Washington	27,132	24,091	-11.2
Total, NWEAI region	95,500	81,678	-14.5
	Entire state		
California	66,200	49,700	-24.9
Oregon	64,371	54,892	-14.7
Washington	39,159	35,795	-8.6
Total, Pacific Northwest	169,730	140,387	-17.3

Source: State employment agencies.

availability. In Oregon and Washington, there has been an upward trend for at least 20 years in the proportion of SIC 24 employment in secondary manufacturing industries, such as millwork, manufactured housing, and pallets, and a decrease in the proportion of SIC 24 employment in the primary wood processing industries, such as sawmills and veneer mills (Raettig and McGinnis 1996).

When the changes in the number of SIC 24 jobs are examined for individual counties (fig. 4) and compared with the harvest decreases (fig. 3), it is evident that the counties with the greatest proportionate decrease in harvest are not necessarily those with the largest proportionate decreases in employment. Of the 12 counties with a SIC employment decrease of 25 percent or greater, only 5 had harvest deceases of 60 percent of greater. Eight counties in the NWEAI region actually had increases in SIC 24 employment between 1990 and 1994, including two (Jefferson County, Oregon, and Trinity County, California) with relatively large harvest declines. When the impact of harvest decreases on employment in the forest products industry is considered, it is important to examine flows of raw materials to processing centers and the potential offsetting effect of employment in the secondary forest products industries.

Although changes in forest products employment provide one indicator of the impact of changing timber harvest levels, other factors merit consideration. One such factor is the importance of the forest products industry compared to other industries within the local and regional economy. When the NWEAI region as a whole is considered, forest products industry (SIC 24) employment accounted for 4.5 percent of total covered employment in 1990. The forest products industry is the largest manufacturing sector (at the two-digit SIC level) in northern California and western Oregon and one of the largest in western Washington.

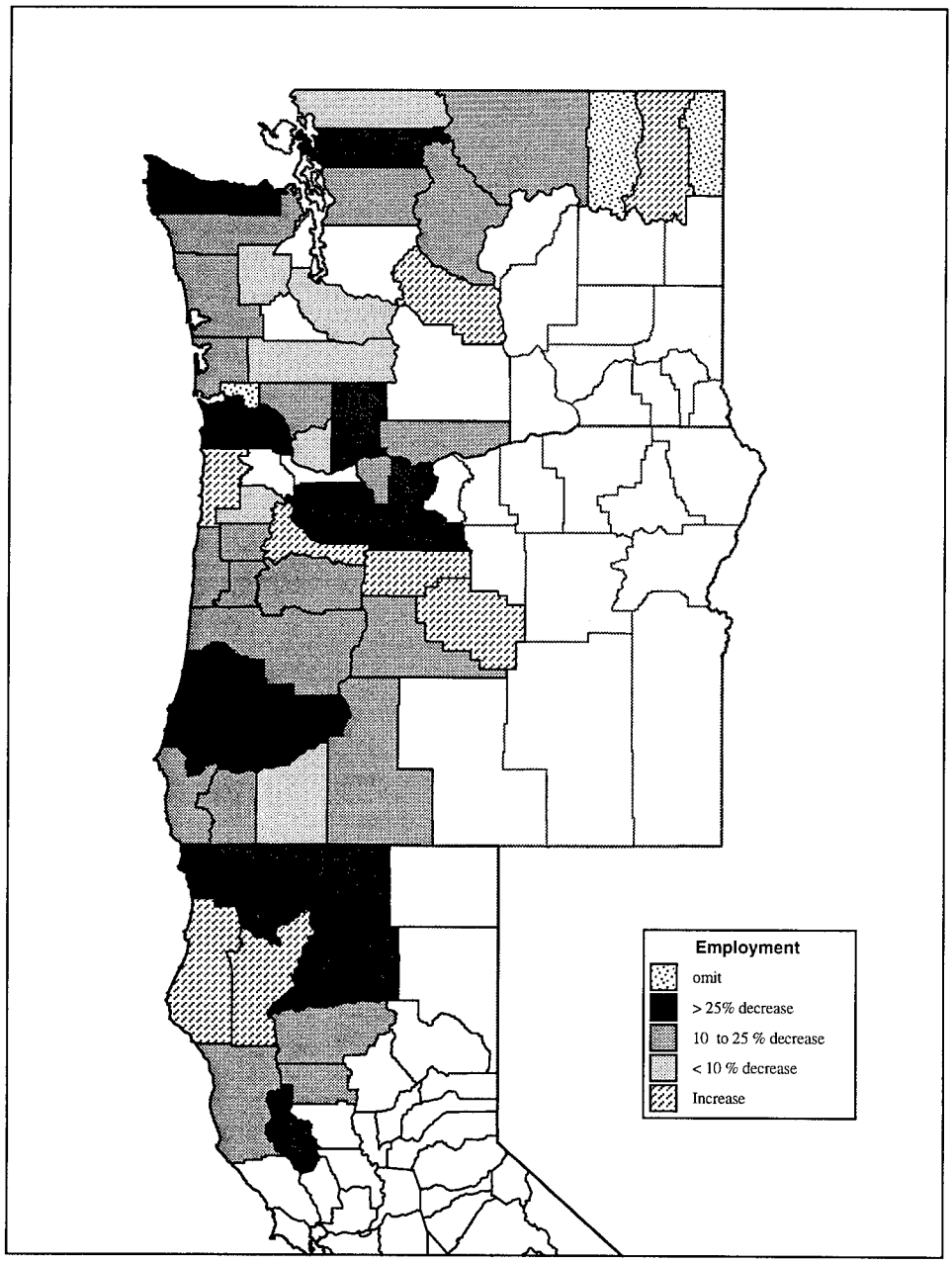


Figure 4—Percentage of change in SIC 24 employment in the NWEAI region between 1990 and 1994. Employment data for Ferry, Pend Oreille, and Wahkiakum Counties in Washington are omitted to avoid disclosing data for individual firms.

For many of the individual counties in the NWEAI region, the forest products industry is a more significant factor in the local economy than it is in the regional economy (fig. 5). In 1990, the forest products industry accounted for more than 10 percent of total employment in three Washington counties and four Oregon counties. That same year, the industry accounted for between 5 and 10 percent of the total employment in an additional six counties in northern California, nine counties in western Oregon, and six counties in western Washington.

The NWEAI and Economic Assistance

Changing natural resource management policies, the declining timber harvests, and subsequent loss of lumber and wood products employment became issues of national importance by the early 1990s. In April 1993, President Clinton convened the forest conference in Portland, Oregon, to address ecosystem management and related social and economic issues in the Pacific Northwest (Clinton and Gore 1993). The forest conference was the catalyst for the completion of the Northwest Forest Plan. President Clinton provided a set of principles to guide development of the Northwest Forest Plan, and the first of these principles came in the form of direction to remember the social and economic aspects of the issue and provide economic development opportunities when necessary. The NWEAI is the economic assistance part of the Northwest Forest Plan and was designed to deal directly with impacts resulting from the timber harvest and employ-ment changes documented previously.

The NWEAI brings together the rural community and economic development programs from five Federal departments and two independent agencies to provide a focused ef-fort to mitigate the adverse impacts of the changing natural resource management policies and provide for comprehensive development regionally. The NWEAI is managed to ensure cooperation of the Federal funding agencies and the active participation of the state, local, tribal, and nongovernment entities in the region (Tuchmann and others 1996). Most of the Federal funding provided through the NWEAI has been in the form of grants, loans, and loan guarantees. Projects have been divided into four major categories of assistance: workers and families, business and industry, community and infrastructure, and ecosystem restoration.

The NWEAI was to provide $1.2 billion in Federal funding for the region over 5 years (Clinton and Gore 1993). Funding for the first 4 years of the NWEAI (table 4) shows that actual NWEAI expenditures by the Federal funding agencies was $121,786,102 in 1994, the first year of the initiative, and has been above $200 million in each of the three succeeding years. The total is almost $800 million for the first 4 years of the initiative. In addition to the money provided through the Federal funding agencies, the Small Business Administration has provided more than $630 million in loan guarantees for the region over the four fiscal years of funding. California has received 22.7 percent of the total Federal funding, Oregon 48.2 percent, and Washington 29.1 percent over the first 4 years. The business and industry and communities and infrastructure categories (table 5) have accounted for an increasing share of total NWEAI funding and, by fiscal year 1997, together accounted for more than 80 percent of total funding.

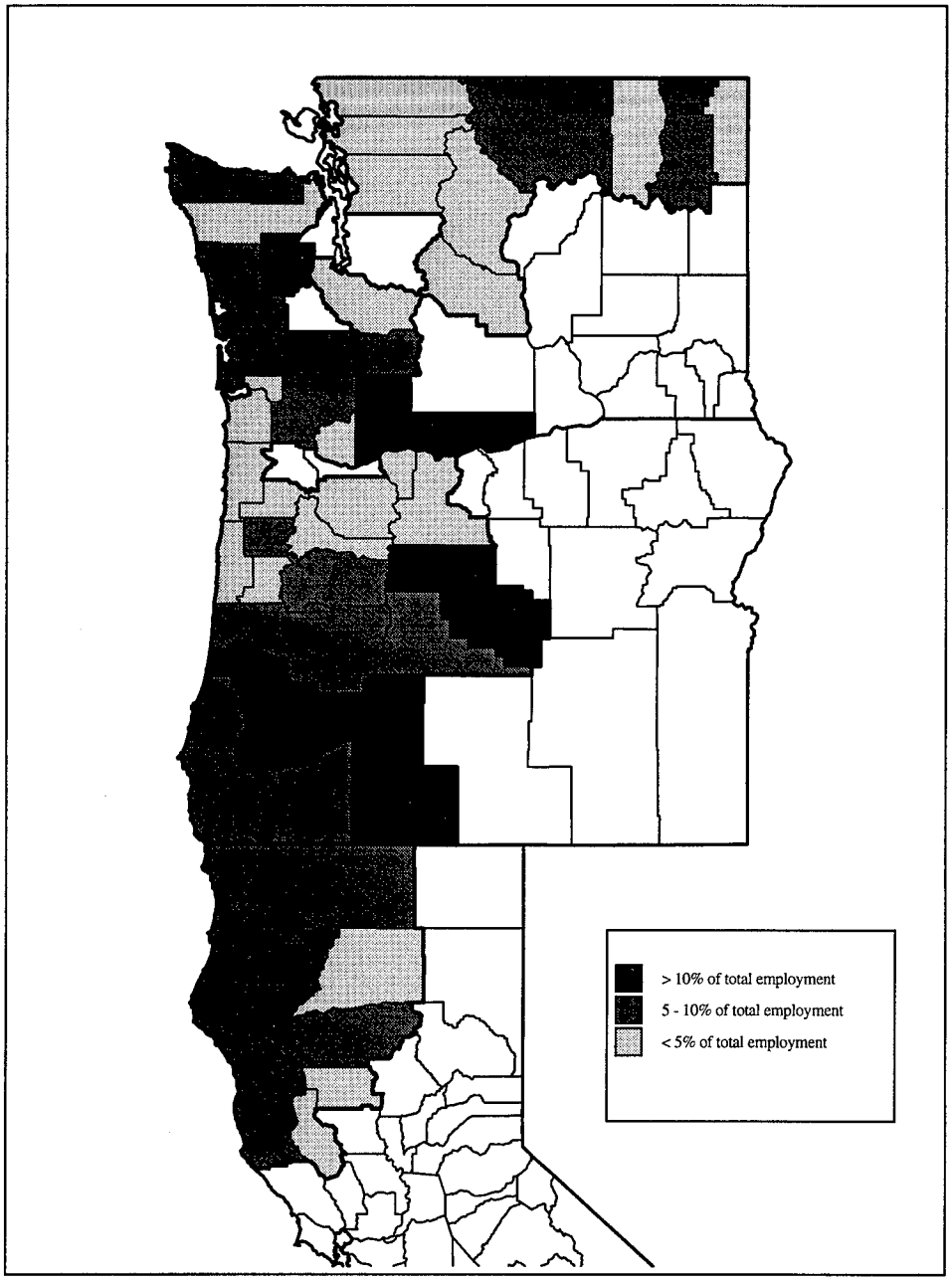


Figure 5—Forest products industry employment (SIC 24) as a percentage of the total 1990 employment (U.S. Department of Commerce, Bureau of Economic Analysis 1997).

Table 4—Total NWEAI expenditures by state, Small Business Administration, and fiscal year

State and agency	Fiscal year 1994	1995	1996	1997	Total
			Dollars		
California	26,444,300	54,458,493	51,130,000	47,378,683	179,411,476
Oregon	58,695,650	94,499,404	103,750,000	122,035,786	378,980,840
Washington	36,646,152	68,886,247	60,950,000	62,460,343	228,942,742
Total	121,786,102	217,844,144	215,830,000	231,874,812	787,335,058
SBA[a]	164,308,960	162,955,926	169,260,000	135,897,983	632,422,869

[a] Small Business Administration loan guarantees for the NWEAI region.

Sources: Tuchmann and others (1996) for fiscal years 1994-96. USDA Rural Development (1998) for fiscal year 1997.

Table 5—NWEAI funding for fiscal years 1994 through 1997 by category of assistance

Category of assistance	Fiscal year 1994	1995	1996	1997
			Percent	
Workers and families	7	9	6	6
Business and industry	31	23	29	28
Community and infrastructure	37	53	50	53
Ecosystem investment	25	15	15	13

Sources: Tuchmann and others (1996) for fiscal years 1994-96. USDA Rural Development (1998) for fiscal year 1997.

The NWEAI created a regional community economic revitalization team (RCERT) to provide regional coordination of implementation efforts and a state community economic revitalization team (SCERT) in each state to guide NWEAI efforts in the states. NWEAI funding as reported by the three SCERTs is concentrated in heavily impacted counties or those counties providing economic and community development services to the surrounding impacted counties. Within California, 3 heavily impacted counties (Lake, Siskiyou, and Trinity) out of the 10 counties included in the NWEAI region received 52 percent of the NWEAI county-level funding reported by the California SCERT. Similarly, in Oregon, 4 counties (Douglas, Lane, Marion, and Polk) out of the 21 in the NWEAI region accounted for 40 percent of NWEAI funding for fiscal years 1994 through 1997. In Washington, Clallam and Grays Harbor Counties accounted for one-third of the NWEAI funding allocated to 23 counties. U.S. Department of Agriculture agencies (Rural Development and the Forest Service) have provided about 70 percent of the total NWEAI funding in each fiscal year except for 1994 (the first year of NWEAI).

Specific NWEAI projects are extremely diverse, which reflects both the variety of Federal funding programs included under the NWEAI umbrella and the innovative approaches to community and economic development generated by those involved with the NWEAI. Several projects directly support developing community infrastructure, such as sewer and drinking water systems, industrial parks, and buildings that provide initial space for new, small businesses (business "incubator" buildings). Still other projects have provided loans from nonprofit entities to small and emerging businesses (intermediary loans), technical assistance in preparing strategic plans, ecosystem restoration activities, and worker retraining. The information included here is designed to provide only a brief overview of economic development efforts in the NWEAI region. More comprehensive information is available in other publications (Raettig and others 1998, Tuchmann and others 1996), from the various Federal funding agencies, and in SCERT reports.

Conclusions

Several conclusions can be drawn from this examination of timber harvesting and, processing employment and from economic assistance data for the NWEAI region.

- Timber harvests in the NWEAI region decreased by almost 50 percent between 1989 and 1994. Decreases in harvest from Federal lands have been even greater, with a decrease of 80 percent from 1989 levels. Total harvest in the NWEAI region now seems to be stabilizing as the Northwest Forest Plan is implemented and public timber sales are resumed at new, lower levels.
- Employment in the lumber and wood products sector in the NWEAI region declined markedly as harvests were declining, with the loss of about 14,000 jobs in the region. Employment losses were not as large proportionately as harvest declines because of offsetting increases in secondary forest products manufacturing and those parts of the lumber and wood products sector not dependent on local timber harvests.
- There are important differences in the patterns of timber harvest decline and employment losses within the region. Certain counties that were relatively more dependent on public timber supplies have experienced the most severe impacts.
- The NWEAI was created to provide economic assistance to the region. Large amounts of Federal community and economic development financial resources have been directed to the impacted NWEAI region.

Acknowledgments

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The Northwest economic adjustment initiative (NWEAI) provides economic assistance to a region including western Washington, western Oregon, and northern California. Timber harvests have fallen markedly in this region since 1990. The forest products industry is the largest manufacturing sector in the region, and employment has followed the downward trend in timber harvest. There are important differences in the declines in timber harvest, employment, and the importance of the forest products industry at the county level. The NWEAI is a significant initiative designed to coordinate and manage Federal economic assistance efforts in the region.

Keywords: Timber harvest, employment, economic assistance, Northwest Economic Adjustment Initiative.

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