

A Market Based Strategy for Rural Development In Northwest Louisiana: Maximizing Opportunities Through Value-Added Forest Products Industries

Findings and Recommendations

Dr. Richard P. Vlosky
Assistant Professor

Nathan Paul Chance, MBA
Research Associate

*Forest Products Marketing Program
Louisiana Forest Products Laboratory
Louisiana State University Agricultural Center*

Dr. Pamela Monroe
Associate Professor

Lydia Blalock
Research Associate

*School of Human Ecology
Louisiana State University Agricultural Center*

Dr. David W. Hughes
Associate Professor

*Department of Agricultural Economics and Agribusiness
Louisiana State University Agricultural Center*

Conducted by:

The Forest Products Marketing Program
Louisiana Forest Products Laboratory
Louisiana Agricultural Experiment Station
Louisiana State University Agricultural Center
Baton Rouge, LA

June 1998

This research was made possible by grants from the U.S. Department of Commerce, Economic Development Administration, The Coordinating & Development Corporation Shreveport, Louisiana and the Louisiana State University Agricultural Experiment Station.

This Economic Adjustment Strategy was accomplished by staff of the Louisiana State University Agricultural Experiment Station through Economic Adjustment Assistance Grant N. 08-29-03048. The statements, findings, conclusions, recommendations and other data in this report are solely those of the grantee and do not necessarily reflect the views of the Economic Development Administration.

Project Description

This project is an innovative approach to stimulating economic development and alleviating chronic long-term economic deterioration in rural resource-based regions. Targeting the secondary forest products industry as a driver for economic development, the project addresses a number of areas including markets for value-added products, industry labor skill requirements, training needs, sociological factors which impact and/or influence the labor market and potential economic outcomes based on various industry development scenarios.

The methodology incorporates a holistic approach that emphasizes long-term sustainable industry development. The goal is to develop the wood products industry while adding value to existing resources, creating employment opportunities with transferable skills and maintaining the stewardship of renewable resources in rural communities.

The nature of the analysis methodology is such that during implementation phases continued analysis and systematic follow-up allow planners to foresee changes in demand and react to conditions. Thus, driven by market demand, new jobs are likely to be created and maintained. In addition, rural residents may be more likely to find suitable employment in their community.

As is the case with most economic development efforts, forest sector strategies rely on either retention and expansion of existing companies or attracting new industrial investment. In addition, most industry development efforts focus on value-added secondary processing (i.e. dimension products, furniture, flooring) as opposed to primary production (i.e. lumber and plywood) in order to retain and expand jobs in rural areas. Value-added secondary wood processing offers opportunities for increased profitability through higher margins and greater profits. Employment is encouraged with larger numbers of smaller local companies instead of a few large primary-processing plants. In addition, higher economic multipliers are realized in secondary manufacturing compared to primary conversion (Syme & Duke 1991).

Making secondary wood products often offers opportunities that primary processing does not normally offer. For example, secondary manufacturers can generally increase prices to make up for lost profits when raw material costs rise. Secondary products also earn higher profits by adding value and meeting specific customer needs. Secondary products can also lead to better resource utilization. Making specialty products instead of commodities allows a company to take better advantage of new markets. Secondary processing also allows a producer to respond quickly to new trends, such as home remodeling-repair markets (Syme & Duke 1991).

In locales where jobs are in short supply, locally generated secondary forest products industry jobs which create transferable skills may offer a viable alternative to forced migration to maintain or increase employment (Skog 1991). Further, secondary forest products wages often exceed average wages of other jobs in rural areas adding incentives for recruitment and development efforts aimed at secondary forest products industry companies (Skog 1991). In addition, export oriented timber related companies may offer rural communities added benefits as exports have the potential for enhancing the multiplier effect of forest based economic activity (Carriker 1988).

Many states and regions in the United States are diversifying rural economic opportunities through forest resource based industry sector development. Kentucky, Maine, Oregon, Pennsylvania and Washington are examples of states that are taking advantage of forest resources to improve economic conditions within their borders (Jones et al. 1989). In this study, we examine industry development opportunities specific to Northwest Louisiana.

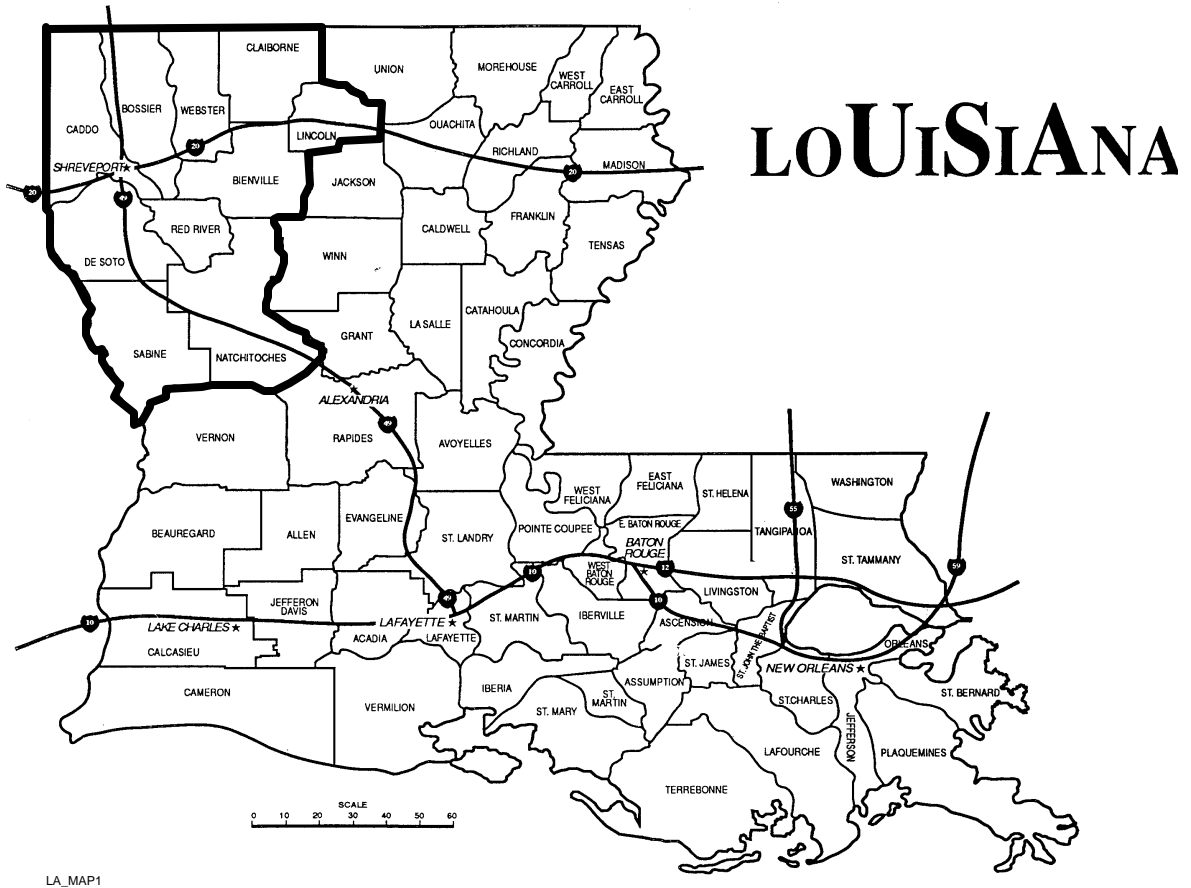
Implementation will rely on broad participation of decision-makers in private and public sectors to identify appropriate roles for various interested parties or stakeholders, and to develop solutions and future courses of action. Both public and private sector input and participation will be integral to success of the project. It is anticipated that entities including the Coordinating and Development Corporation, industry participants, academic institutions, and state and local governing and economic development bodies will bring the necessary resources to bear to move into implementation of study recommendations and courses of action.

The Problem

In the wood products industry, Louisiana produces only \$.97 of value-added product for every \$1.00 of lumber created by the sawmills operating in the state. This compares to the southern average of \$2.13 of value-added for \$1.00 of sawmill product produced. Improvement of industry competitiveness can increase potential for jobs creation and resource utilization in the rural-based forest products industry. However, to attain this potential, a wide variety of issues must be addressed. For example existing consumer market trends, location decision criteria, raw materials availability and applicability, labor force skills and training requirements, target market identification, recruitment and retention strategies, comparative advantages and effects on community stability should all be considered as part of an economic development initiative.

The “Study Region” parishes included in this study are Bienville, Bossier, Caddo, Claiborne, Desoto, Lincoln, Natchitoches, Red River, Sabine and Webster. (Figure 1). The area is chronically lagging the rest of the country with regards to employment and other economic indicators. In addition, forest resource depletion is exceeding sustainable levels for some key species. All parishes in the contiguous ten-parish region conform to Long-Term Economically Depressed (LTED) eligibility as defined by the US Department of Commerce, Economic Development Administration.

Figure 1. Study Region



Project Objectives

Specific project objectives are to:

1. Conduct a regional forest resources assessment as an indication of raw material supplies.
2. Identify the existing industry structure.
3. Analyze sources of competitive advantage for the region's secondary forest products manufacturing base and identify broad sectors with high growth and market potential.
4. Determine social and economic profiles for the study region.
5. Describe the pool of eligible workers in the area to support industry development.
6. Identify labor skill needs of the value-added secondary forest products industry.
7. Estimate economic impacts resulting from various forest based industry development scenarios.

8. Generate information that can assist policy makers to formulate strategies for implementation of rural economic development efforts designed to capitalize on defensible market driven opportunities in forest products industry sectors.

As we began this study, we found that actual assistance to policy makers to formulate strategies and develop success measurement methodologies was not feasible. These issues need to be addressed after the report is disseminated and appropriate policy participants are identified. Accordingly, two original work elements in the grant proposal regarding these issues were not undertaken. Objective 8, the generation of information to aid policy makers, was accomplished.

Study Components

This study contains six main components:

1. A forest resource assessment of the study region
2. An Industry structure profile
3. A market assessment for current and potential manufacturers
4. An evaluation of the economic contribution of the forest products sector to Northwest Louisiana
5. Socio-economic-demographic and work readiness issues that exist in the region
6. A discussion of employee training and development needs

Classifying Solid Wood Products

Solid wood (as opposed to pulp and paper products) forest products can be broadly characterized as primary or secondary products. This classification is not always clear, but most industry observers agree on general definitions of the groups:

- Primary products are those which are produced directly from raw timber input. Examples include chips, lumber, veneer, plywood, and their by-products.
- Secondary products use primary products as input for remanufacturing. Examples include various types of panels, engineered composites, or dimension stock. Secondary products can also include final consumer products such as furniture. This study focuses on the secondary, or value-added sector of the industry.

Summary of Findings

Regional Forest Resources

1. The ten-parish study region covered in this report represent 15.6% of the parishes of Louisiana. However, timber lands in the region account for approximately 3.6 million acres or nearly 26% of the total 13.9 million acres of forested land in Louisiana.
2. Predominant species include 2.37 million acres of southern yellow pine and oak, 691 thousand acres of upland hardwood species such as oak, hickory and sweetgum and about 535 thousand acres of bottom-land species such as water oak, tupelo gum and cypress.
3. The data clearly indicate that the study region contains significant quantities of quality commercial softwood and hardwood timber to support further development of the secondary forest products industry.
4. Companies in the region produce a wide variety of products from the resource base and distribute these products around the world. In addition to the utilization of raw materials from within the region, these companies also import raw materials from adjacent states and parishes to manufacture products for industrial, commercial and end-user markets.
5. Most parishes in the region have seen increases in their respective volumes of forestland in the period between 1984 and 1991. Sabine parish is reported to have the greatest volume of softwood while Natchitoches parish contains the greatest volumes of hardwood species. Considering softwoods and hardwoods combined, Natchitoches parish has more timberland than any other parish in the study region.
6. Volumes of cypress timber in the region, though significantly smaller than that of pine, have grown during the past decade. This increase in standing cypress timber may well represent a niche-specific opportunity for job creation.
7. A reduction in growth/removal ratios for the region indicates that harvesting pressure is being placed on the resource.
8. Volume for all diameter size classes except pole timber has increased over the 1974-1984-1991 time periods. This finding is important given the conventional wisdom that holds that private landowners are less likely to replant once they have harvested the commercial timber on their lands.
9. Future supplies of hardwood resources for value-added solid wood processing may be affected if the existing hardwood timber stands of immature trees are sold for chip and paper production.

10. Private non-forest industry landowners make up the majority of the land ownership structure in the region. This is a crucial factor because it could have significant impact on the availability of raw materials, how and to whom these raw materials are sold and the amount and distribution of regeneration of timber resources on these lands.

Solid Wood Products Industry Structure

12. The region's forest product industries represent important job creation opportunities. World demand for products manufactured by the region's companies is increasing. Numerous products are manufactured and are shipped to markets around the nation and world.
13. The majority of the secondary forest products companies are small and use relatively unsophisticated standardized manufacturing processes and equipment. However, these companies are able to compete in the markets they serve. Those companies that have grown and prospered have done so by exploiting specialty niches and cutting costs.
14. Demand is especially good for grade hardwood lumber used in flooring, cabinetry, furniture and other high value-added applications. In addition, utility grade hardwood materials are used in many applications including transportation-oriented products and in construction applications.
15. Softwoods originating in the area have an almost unlimited application from pulp and paper, cellulose by-products, construction industry applications; domestic and foreign as well as land based and marine applications. Growing demand from around the world is causing the stumpage value of softwoods to soar. Study region producers are responding by increasing planting as well as investing in more efficient technologies in order to take greater advantage of the region's resources.
16. The outlook of most managers in the region is for continued market opportunity due primarily to increased scarcity of forest resources in other regions of the US.
17. Related to the availability of resources and increased utilization efficiencies is the issue of recycling of currently unusable by-products. The issue of waste utilization was identified as a major issue.
18. Managers are concerned about the availability of qualified labor. There is a lack of training opportunities for new employees as well as to upgrade the skills of existing labor. Of particular concern is the lack of basic skills and the need for training of entry-level labor. At the skilled and semi-skilled level, managers reported an absence of computer operation and logic control system skills. Also, the availability of labor skilled in the maintenance and operation of hydraulic and computer controlled

hydraulic systems were identified as critical skills needed in the region by the larger employers.

19. Numerous issues were identified by the owner/managers with whom we spoke concerning future development of their companies as well as a concern the industry in general in Northwest Louisiana area including:
 - ◆ Future dependence on international markets
 - ◆ The lack of exporting technical assistance or knowledge of sources for such assistance
 - ◆ Governmental regulation restricting access to public forestlands
 - ◆ Environmental and administrative regulation controlling harvesting quotas
 - ◆ Local sales taxes and tax codes
 - ◆ The complexity of complying with state and federal regulatory requirements
 - ◆ Lack of local access to sea going containers
 - ◆ Poor labor quality
 - ◆ Need to reduce the amount of waste being lost to landfills. This factor is a major loss of potential revenue and an issue that is becoming an environmental concern as well.

20. The most important factors preventing manufacturing industry development in the region are the cost of workman's compensation insurance and corporate taxes. A focus on value-added manufacturing in order to create skilled higher paying jobs will require an effort of local and state officials aimed at leveling the playing field with other states in terms of the impact of manufacturing disincentives. In addition, legislation aimed at bringing worker's compensation premiums in line with loss payment decreases was identified as being beneficial.

Markets and Market Potential

21. The study region is faced with several unique opportunities to pursue future development of the secondary forest products industry. Seven commercial timber species have been identified with moderate to high commercial value. Another four species would be considered as low commercial value. Even species with low commercial value species represent opportunities in a variety of utility grade applications such as pallets, crates, boxes, marsh matting, baskets, promotional furniture and cabinets.

22. Southern pine raw materials of desired timber size and quality will continue to decrease as more pressure is placed on the region to replace anticipated production declines in the Northwest. This indicates a need to add more value to the existing resource.

23. Hardwood supplies should remain stable provided no major industrial market developments are made. Softwood lumber will continue to be restricted in width and

length because of the reduced availability of larger saw timber. One factor contributing to softwood saw timber availability will be the continuing short rotation trend on pine plantations producing primarily pulpwood.

24. Improving manufacturing technologies is an important consideration for industry development.
25. Opportunities exist for small and midsize firms to produce intermediate and final products. Examples include dimension stock, millwork, timber laminating, end- and edge-gluing and surface overlaying.
26. Market niches will emerge to meet market needs by providing additional value-added production or services. New product development will be required to convert commodities into products that can be readily used without further processing.
27. Where possible, integration of businesses into informal and formal networks will provide smaller companies with the ability to compete and will provide larger companies with the ability to change quickly to meet market needs.
28. Partnerships with material suppliers and product purchasers will continue to increase in order for companies to better compete.
29. The keys to success in secondary products are manufacturing a high quality product, pricing that product competitively, and then providing unbeatable service to the customer.
30. Product group opportunities with potential for growth and expansion include hardwood wood components, ready-to-assemble furniture, architectural millwork, hardwood flooring and treated softwood value-added products. Beyond these broad product groups, there are likely to exist niche opportunities for a number of wood products.
31. On a limited geographical market basis, household furniture and cabinets have a moderate competitive environment and market attractiveness, particularly in niche markets. These segments should be targeted for selective investment where risk is minimized.
32. Ready-to-assemble (RTA) furniture is growing and maturing as a product line. It does not look like RTA anymore. Many pieces are difficult to tell from traditional goods. RTA shipments in the United States are forecasted to grow by more than 10 % annually over the next two to three years. Much of the recent growth in this market is due to demand for medium to upper-end home theater and home entertainment pieces, followed by home office and youth bedroom.

33. Larger furniture manufacturers are most concerned with having an available, trainable labor force, while smaller manufacturers look for an existing supply of skilled labor. Technical assistance in the area of training is valued by both.
34. Other important factors in selecting a site for furniture manufacturing plants are distribution/transportation and access to raw materials. The primary form of transportation of concern to manufacturers is trucking, therefore, a potential location is considered attractive if it provides good access to major North/South and East/West highways and major trucking lines. Although proximity to raw materials is important to both large and small manufacturers, it is more critical to smaller manufacturers.
35. The pallet industry is one of the major forest product industries in the United States. The industry is the largest consumer of domestic hardwood lumber. In addition, the demand for wooden pallets in the United States is constantly increasing. Although not one of the top seven product groups identified for further expansion, opportunities for pallet industry expansion should be considered.
36. Overall, export market opportunities should be explored. Strength in overseas markets will enable U.S. household furniture manufacturers to boost export sales. Exports accounted for an estimated 5.8 % of total household furniture shipments in 1994 and are projected to rise to a 7.6 % share by 1999, supported by demand from world economies. Wood household furniture remains the largest export category at 45 % of dollar volume while the fastest growing category is household furniture parts. International markets are the most significant for household furniture other than wood or metal, with 29 % of shipments sold to overseas customers.

Economic Impacts of Value-Added Industry Development

37. The potential of the value-added forest products industry has been increasing as a means of facilitating economic development. The value-added forests products industry has the potential for supporting economic growth in rural areas of Louisiana.
38. Results of an economic model of the ten parishes in the study region indicate that growth in the sector would make a fairly substantial contribution to overall economic activity in the region. Results also indicate that development of the industry may be an appropriate way to create economic opportunities for lower income households.
39. Output multipliers of particular interest for this study include a \$1.96 change in total regional output for a \$1.00 change in sales by Kitchen Cabinets and Millwork, the output multiplier of \$2.18 for Structural Wood Members, the output multiplier of \$2.17 for Wood Preserving, an output multiplier of \$1.87 for Furniture, and an output multiplier of \$1.90 for Wood Partitions. Output multipliers for three of the five value-added forests products industries were among the top five industrial sectors in terms of output multipliers out of seventeen sectors analyzed.

40. Total income multipliers for the five value-added forest products industries ranged from \$0.80 for Structural Wood Members (ranked fourth among the seventeen industries) to \$0.58 for Wood Preserving (ranked twelfth).
41. For four of the five value-added forests products industries, multipliers for low income household were larger than average. This result implies that growth in the five industries may be especially beneficial to low income households. Among the five sectors, Kitchen Cabinets at \$0.23, Structural Wood Members at \$0.19, Furniture at \$0.23, and Wood Partitions at \$0.22 had larger than average increases for low income level households.
42. A scenario analysis of the economic impact of a doubling of the value-added wood products sector was conducted. Total sales by the five industries were estimated to equal \$95.91 million in 1993. Hence, a 100 % increase in output by the four industries lead to a direct impact scenario of that level. The 100% increase in industry output was projected to lead to a \$202.65 million increase in economic activity in the regional economy and 2,264 new jobs created. Hence, such a level of growth in value-added forests products industries would provide a fairly substantial increase in overall regional economic activity.
43. As a comparison, an impact analysis was done for a 25% increase in output for the five value-added forests products set of industries. The direct change in output in the five industries was \$23.98 million while the total change in output in the regional economy was \$50.66 million or a projected gain of 0.3 % in output over 1993 levels for the entire regional economy. The increase in total regional employment was expected to be 566 jobs. The increase in gross regional product was projected to be \$20.59 million.

Socio-economic Issues and Work Readiness

47. Research has confirmed the importance of industry examining the social structure of a community where jobs may be created. The social structure of a community allows for an understanding of education constraints, social stratification, economy and the knowledge base that already exists in this community. The decision to locate an industry to a particular location may not be based as much on the quality of the labor pool but on the natural resources within the particular area.
48. One standard metropolitan area is located in the region, the Shreveport-Bossier City Metropolitan Area, that includes Caddo, and Bossier parishes. Socio-economic indicators for this area (especially Bossier) tended to be better than the regional averages, but since the difference was only 2%, the area was included in the regional figures. It should be noted that several gaming establishments are based in the area.
49. The Northwest Region is home to 13% (545,527) of the state's total population. Approximately two-thirds of the residents live in urban areas, with the remaining one-

third of the population residing in rural areas. This region mirrors the state for most socio-economic indicators. Some items though, are noteworthy for divergence. The race figures for this area are slightly different from the state's %ages, with the region reporting 63% of the residents as white and 36% black and the state reporting a 67%/31% split. In general, income and poverty measures indicate that this region has 5-7% more of its residents below the poverty level than the state as a whole. The 1993 per capita income figure for the Northwest Region was \$14,766, 88% of the state per capita of \$16,612. Only the Bossier/Caddo area reported higher per capita income than the state.

50. In some parishes, up to 43% of the potential labor force lacks a high school diploma.
51. Based on the foregoing macro-level data, we can describe the Northwest region as poorer and less educated than the state's population as a whole. This should not be interpreted to mean that the region is in some way substandard, but rather that the socio-economic indicators reflect certain areas that are problematic throughout the state.
52. It is difficult to know for certain the extent that substance abuse or gambling is a problem for significant numbers of potential workers. Anecdotal evidence, though, suggests that concerns in these areas may be valid.
53. The backdrop for our examination of the labor pool in this region is the "welfare reform" plan currently being implemented in Louisiana and the nation. Because of the attention focused on welfare to work programs, we believe it is timely to investigate the suitability of introducing value-added industries to economically depressed areas as adjuncts to welfare reform policies. Women are the most common adult recipients of welfare, and many of them will be pushed into the labor force when their eligibility comes to an end. Jobs and workers are often scarce in rural areas, so we wanted to explore the suitability of employment in the forest products industry for (soon-to-be) former welfare recipients.
54. Women comprise 50% or more of the available labor pool in each parish. It should be noted that women also are the head of household for an average of 23% of all families in the region, and of these, up to 78% include children that these women must support.
55. Given the low wages paid to entry level unskilled workers, and the low per capita income rates for the region in general, it is not surprising that government assistance (welfare) has been an option for a significant portion of the pool of workers.

Work readiness

56. We cannot overemphasize a sentiment repeated throughout interviews with employers in the wood products industry: More important than any skill is a person's

willingness to work. This attitude, more than a set of skills, defined *work readiness* to these business men and women. Employers consistently emphasized that the “right person” — that is, someone with a positive attitude — could be taught the jobs and skills required in their workplace. Employers described such a person with phrases like, “willing to work from the bottom up,” “willing to learn,” “tough-minded,” “self-motivated,” and possessed of a “work ethic.”

57. The employers also indicated that a negative attitude could not be overcome with training and education, that some people simply were “quitters.” We surmised that work readiness is an elusive concept, recognizable when seen but hard to predict.
58. Employers indicated to us that they were perfectly willing to hire women; however, few of them actually had any women working for them at the present time or in the recent past. As for the workers themselves, there were mixed opinions about working with women. Most of the workers indicated that they had no problem whatsoever with women in their workplace as long as they did their job. The men in our focus groups seemed equally disdainful of a man who would slack off as of a woman who did the same; they indicated that they would make such a man as uncomfortable working there as they would make a woman. Some employees expressed reservations about a woman’s ability to handle the strenuous physical aspects of the job, but indicated that some men wouldn’t be able to do the work either.
59. Employers told us that they expect to train new employees and that they do not expect an entry-level person to possess highly specialized skills. They indicated that a *positive attitude* and *work ethic* were the most important factors for employee success.

Employee Training and Development

60. Most of the employers interviewed did not have specific education or training requirements for their entry level positions. Employees were not required to have a high school degree or GED certificate, neither was vocational training a prerequisite for employment. Some employers even suggested that generalized vo-tech training could be something of a hindrance for many of these positions, at least in part because most shops have their own assembly and finishing methods. All of the employers emphasized that a “willing” attitude was as important as formal education or training.
61. We asked the employers to identify the skills someone might need for an entry level position in their workplace. A common theme throughout the interviews was that a beginning employee needed basic math skills and the ability to read a tape measure. Basic reading ability and carpentry skills would also be helpful for an entry level position.

62. Because outside training is not available, most employers expect to train workers on the job or to assign a beginning worker to a senior worker to learn the various tasks required in their shop. If training was available outside the company, many manufacturers said they would take advantage of this opportunity.
63. Many larger companies report the need for specialized equipment or process training. Again, the current educational system has been unable to provide the flexibility and diversity of training for these companies. In many cases, this may be the result of lack of knowledge about where to locate or outsource a particular expertise, or perhaps, because of a lack of communication between education and industry.
64. Most companies have not developed formal training programs due in large part to the disruptive nature of formal training in an operating situation. Most of the people interviewed indicated that establishing such programs internally is simply too time consuming, expensive and locating the available resources for such training has been very difficult in addition to the aforementioned problem.
65. In order to reach as many owner/managers as possible, we propose offering educational and training services utilizing varied media including formal classroom instruction, certificate courses, seminars and workshops, computer aided long distance learning and technical videos. In addition, outside expertise may provide specialized machine and process training. The core of an industry-specific training effort would be the establishment of comprehensive curricula into a production management/operations "institute".
66. Training needs identified in current research include skilled, semi-skilled, business and production management, as well as basic skills and remedial support. Programs of study at a "center" could serve as excellent recruitment incentives to attract new industry.
67. Based on primary and secondary forest products industry hiring intention surveys conducted by the Louisiana Forest Product Laboratory, the number of new employees forecasted in Louisiana over the next 2-4 years totals nearly 4,000 positions. Given this employment demand, as estimated by survey respondents, the need to develop and sustain training programs for the forest products industry is immediate and critical.

Recommendations

The wood products industry is well established in Northwest Louisiana with ample opportunity for additional industry growth and development in secondary or value-added sectors. This growth will come from two areas. First, by identifying markets that have a high potential for success, the focus of the final phase of this project, and second, by

overcoming structural obstacles to economic development. In this section, we offer recommendations that are appropriate to development efforts in the region. These recommendations should be considered as a basis for the implementation phase of this project.

Industry

1. Explore the opportunity for vertical and horizontal development opportunities in existing market sectors to which region companies are currently supplying raw materials or products.
2. Survey existing primary and secondary companies to determine the extent of labor force training needs including computer process control, processing system maintenance and repair and production equipment maintenance and repair.
3. Explore the development of marketing cooperative or joint marketing projects focusing on existing market segments which may offer small value-added companies an affordable conservative development opportunity.
4. Examine the establishment of an active matchmaker program to enhance local business growth through development of networks between businesses in the secondary forest products industry. The proximity of a relatively large number of companies in the Shreveport area lends its self to such activity.
5. Examine ways to develop a better trained or trainable workforce to support industry development. The lack of adequate training facilities, a problem for many value-added processors, needs to be addressed.
6. Periodically update the resource assessment in order to make decisions and policy recommendations concerning regeneration incentives and harvesting activities.
7. In order to monitor the attractiveness of participating in the forest products industry in the region, it is important to understand the overall drivers of product supply and demand. Accordingly, ongoing analysis should be conducted of:
 - ◆ macro-economic demand drivers (housing starts, interest rates, global supply and demand, demographics, etc.)
 - ◆ wood products domestic and international demand
 - ◆ outlook for major raw materials (lumber and panels)
 - ◆ industry structure and needs analysis
 - ◆ market studies for finished products
8. Establish an inter-industry promotional and educational effort aimed at educating wood products companies about the financial industry and vice versa.

9. Establish a production management and marketing training program through vocational technical institutes as well as the university system.
10. Research the overall effect of Louisiana's incentive programs on the cost of doing business for manufacturers compared to other states.
12. Offer export assistance to help identify international trade opportunities and procedures.

Work Readiness

13. Examine development of adult literacy programs and remedial education programs that provide functional literacy and basic mathematics skills to support workforce training. Improve basic education and reorient existing post-secondary training. The employers we interviewed were critical of existing training programs because they believed the skills necessary for their workplace are best taught on the job. Basic math skills, and to some extent basic reading skills, are important to these employers. Training that emphasizes the application of these skills could be of critical importance.
14. Address the critical issues of workforce quality. Specific issues to be addressed are low levels of educational attainment, easy access to and reliance on government transfer payment programs and illicit drug abuse that were cited as the three main workforce issues in this study.
15. Basic and advanced training for specific wood manufacturing skills should be developed.
16. We were surprised to hear many employers refer to their use of temporary agencies not only as a source of temporary assistance, but as a screening mechanism for new permanent employees. They found the temporary agencies to be a better source than the area vocational-technical schools for potential employees with certain skills. Such training centers might partner with temp agencies to gain placement and much needed real world work experience for the students.
17. We do believe that specialized training could be useful to employees who move beyond entry level positions, and that the owners of secondary wood products businesses should be consulted as to the nature of this training. For example, reliable employees could be trained as forklift operators, and in the loading and management of inventory. Other workers could be trained to operate and maintain heavy equipment, such as saws. In sum, basic education should be enhanced and advanced training for specific skills should be enhanced but, in the opinions of the men and women we interviewed, generic carpentry and cabinet skills training is not particularly useful.

18. Create a workplace that is flexible, supportive, and predictable. Further research that helps to understand the factors that motivated labor force participation and to gain insight into variables in the workplace environment that could be manipulated in order to increase employee loyalty and performance.
19. Many of the employers we interviewed offer few or no benefits to their employees, instead paying slightly above minimum wage for entry-level jobs. Some workers were satisfied with this arrangement and did not desire additional benefits — typically those with access to the charity hospital system. But many workers indicated that they valued the benefits they had or that they desired a few benefits such as a week's paid vacation, basic health insurance, or a retirement plan. This information should be communicated to regional manufacturers.

Employee Training & Employee Development

While labor force training issues are a concern for all company executives visited, training in management and marketing issues were pointed out as important for future development as well.

21. Job-training programs for chronically unemployed persons include a work readiness component with, we believe a misplaced emphasis on things like resume writing or “dressing for success.” These programs instead need to help unemployed people develop coping strategies for things like isolation in the work place, for being called upon to do repetitive or menial tasks, and for accepting criticism from a boss. Workers also need to learn how to create their own support network if none is offered or to find their own mentor if one is not assigned to them
22. Again the emphasis should be placed on how to deliver appropriate multi-dimensional educational and training services to the value-added wood products industry. This training must also be able to service the needs of a variety of sectors from which new trainees may be drawn. For example, out-of-school unemployed youth represent one possible pool of trainable labor, high school students involved in school to work programs another, adults changing careers yet another, adults coming into the work force for the first time still another.
23. In order to reach as many owner/managers as possible, educational and training services may be offered through various media including seminars and workshops, computer aided long distance learning, and technical videos, to name a few. In addition, outsourcing of experts to provide specialized machine and process training can also be utilized.
24. The establishment of comprehensive curricula into a production management/operations institute utilizing modular home study methods, as well as programs of study at a “center”, would also serve as excellent recruitment incentives to attract new industry to the state. Such programs would place the state on par with

other Southern states' offerings to wood industry companies. This program could be used in concert with such existing incentive programs as Quick Start, the state's current new or expanding company training offering.

25. The preponderance of Louisiana secondary forest products companies located in the Shreveport-Bossier metropolitan area indicates that this would be a logical site for a training facility. Ruston may also be a candidate location to take advantage of vo-tech industrial maintenance training.
26. Industry concentration occurs because of very short product distribution channels for secondary wood products. Recognizing this, one center which is able to provide machine intensive training opportunities could satisfy this kind of training need within the region.
27. Industry groups or industry concentrations should lend themselves to easy access and communication to serve as intern or apprenticeship sites and placement opportunities for new employees.
28. A training structure should offer maximum flexibility and access to many resources at a minimal start-up and operating cost. The key is the ability of the system to provide a cornucopia of training programs by developing a network of resources available to accomplish a very complex mission of training and coordination.

Suggested Participants for Implementation

If this report is favorably received and policymakers are willing to commit to value-added forest sector development, the study team is willing to continue in a consultative role through implementation. The lead initiative, however, must be taken by industry and policymakers at the community, regional, state and federal levels. In the recommendations section of this report, a number of activities are indicated. We suggest that the following agencies be involved in moving these recommendations to application.

Coordinating and Development Corporation: take the lead role in coordinating an implementation effort in the study region. Funding should be secured to support a full-time implementation coordinator for a period of no less than 5 years.

Economic Development Administration: support further funded research needs identified in the report, support implementation plans in the region, consider expansion of this methodology to an expanded region of southern states.

Louisiana Department of Economic Development: assign personnel in this organization that concur with these findings and that are willing to support implementation efforts in the region.

Louisiana Department of Agriculture and Forestry: play a supporting role in implementation and dissemination of information to industry and other stakeholders in the region.

Louisiana Forest Products Laboratory Research Team: play a consultative role by offering assistance and advice if an implementation process takes place. The team could also conduct additional applied research to support this effort.

Summary

In order for any successful effort to move forward, a regional-level value-added forest products sector economic development initiative is necessary. This initiative must have strong government leadership, interagency cooperation, adequate program funding and strong industry support. Policymakers and development planners must be committed to an industry development program. The necessary infrastructure to facilitate secondary or value-added industry development is in place. The foundation of our recommendations is to utilize and enhance what already exists. The key element is improved coordination and cooperation to achieve goals and objectives.

**A Methodology for Value-Added Solid Wood Products
Industry Development**

Richard P. Vlosky

N. Paul Chance

Introduction

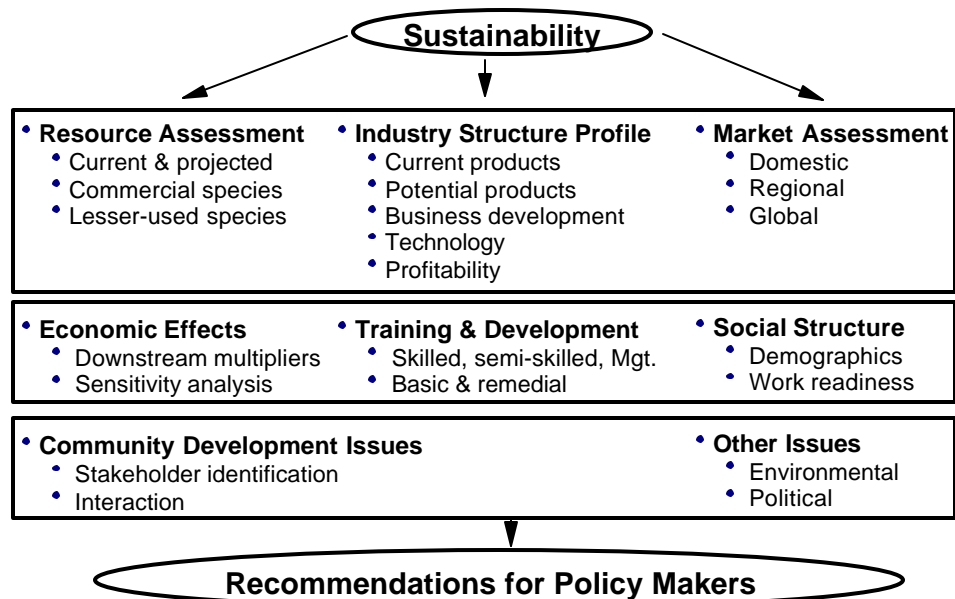
This study employs a systematic and holistic methodology devised by Vlosky and Chance (1995) for value-added forest sector development. In addition to being applied to previous research studies in Louisiana, the methodology is the foundation for recommendations generated by a Governor's Task Force on Forest Products Industry Development in the state of Louisiana (Vlosky et al. 1997a; Vlosky et al. 1997b; Anonymous 1996).

Regardless of the underlying motivation (rural development, adding value, employment enhancement, etc.) the goal of the methodology is to develop sustainable strategies for forest products industry development that will add value to existing resources, create employment opportunities and foster stewardship of the forest resource. The methodology is intended to be a planning tool. For success to be achieved, many entities including local development organizations, industry participants, academic institutions and state and local governing and economic development bodies must be involved collectively to garner the necessary resources to move from analysis to implementation.

Figure 1 shows the elements of the methodology. The concept of sustainability of resources, industry development, communities and markets are foundations of the model and research approach. All components need to move in tandem and in a coordinated fashion for successful forest sector development to occur.

Figure 1.

Integrated Market-Based Value-Added Forest Sector Economic Development



Model Elements

Resource Assessment

The initial step in forest sector development is to discern the current and potential availability of raw materials both at the forest resource and intermediate product levels. In this methodology, we examine over twenty-five resource variables including forest types, current and changes in timberland area by county, timberland area by ownership and stand size class, current and changes in growing stock volume by species, current and changes in sawtimber volume by grade, diameter class and species and sawtimber growth/removal ratios by species. In addition to resource data collection for the study region, comparable information is gathered for adjacent counties within 100 miles of the edge of the region. The reason for doing this is that forest-based industry may be viable in an area even if it is not considered a “wood basket”. Effective transportation and haul distances from region manufacturing facilities are often up to 150 miles.

The data that constitute the basis for the resources of the methodology were derived from numerous sources. In an application of the methodology in Louisiana, these sources included the 1984 and 1991 Forest Inventory Analyses (FIA) conducted by the United States Forest Service (USFS). The FIA survey is a three-phase process that begins with the use of aerial photos of the area of analysis. Forest-nonforest classification of land use is based on identified points of about 230 acres each. This classification is then adjusted through on the ground observations at sample locations. Field data are gathered for per-acre estimates in a grid with points located at 3-mile intervals. The reader is advised to consult USDA, Forest Service Resource Bulletin SO-165 1991 for a more detailed discussion of the statistical methods for data collection.

In addition, the USFS bulletin series for forest statistics of Louisiana published by the Southern Forest Experiment Station (Rosson 1991), the 1992 Census of the United States (US Census Bureau 1995), *Forests of the South*, Southern Forest Based Economic Development Council (Faulkner et al. 1995) and the *Woods of Louisiana* (Harding et al. 1995) were also used.

Industry Structure Profile

One core component of the methodology is development of baseline data on the value-added wood products industry. Elements of an industry analysis are varied and include raw material types and supply status, current and potential products that could be produced, business development plans, technology applications, distribution channels and needs and impediments to growth and development. Examples of questions that need to be answered are:

⇒ What is the structure of the established primary and secondary forest products industry base?

- ⇒ What types of manufacturing processes and equipment do current companies use?
- ⇒ Is there the presence of sawmills, dry kilns, millwork plants, particleboard, hardwood lumber, etc. which could support significant secondary development?
- ⇒ Are current and potential future companies able to compete in the markets they do/will serve?
- ⇒ How have those companies that have grown and prospered done so (exploiting specialty niches, cutting costs, etc.)?

In application, developing measures to empirically test these issues at the industry level in the region operationalizes a number of factors. Examples of such factors included: raw material purchase decision criteria (Forbes et al. 1994), species availability for raw material inputs (Luppold and Dempsey 1994), product and supplier attributes (Bush et al. 1991), markets and market trends (Anonymous 1994), criteria for geographic location selection (McKee 1989) and export activity.

Market Assessment

A major factor in determining the probability of industry success is the market structure for current or potential value-added solid wood products. In this section, a market analysis is conducted with resulting recommendations on high probability product sectors. Objectives for this component of the research methodology are to conduct secondary market research on major product groups and identify products with a high potential for successful expansion or development (Figure 2). Beyond identifying attractive segments for value-added sector development, Figure 2 indicates (on the right of the arrow) corporate-level issues that need to be examined before investment and growth should take place.

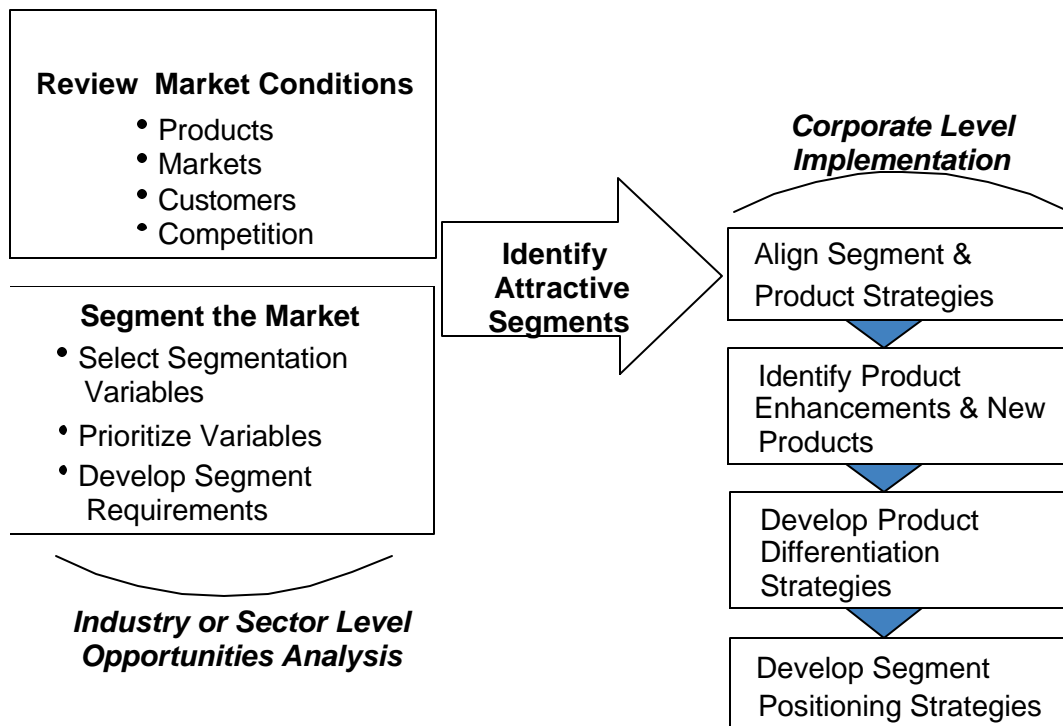
In order to examine the attractiveness of participating in the forest products industry, it is important to understand the overall drivers of product supply and demand. Accordingly, an analysis is conducted of the macro-demand drivers (housing starts, interest rates, global supply and demand, demographics, etc.) for wood products demand and the outlook for major raw material markets (lumber and panels) and finished products for the secondary wood products industry. Specific to companies in the region of analysis, a number of questions are posed including:

- ⇒ What is the product mix of the companies?
- ⇒ What are current markets and customer bases (both domestic and export)?

- ⇒ What is the quality and level of acceptance in current markets?
- ⇒ What is the distribution reach?
- ⇒ What species currently and potentially used by the industry?
- ⇒ What are the information and management needs of the industry to facilitate growth?

Figure 2.

Market Opportunities Analysis



Adapted from Kotler (1995)

Corporate-level market strategy tools, such as the Product-Market Matrix and the Directional Policy Matrix (DPM), are adapted and applied in the research for both identification of competitive factors that can stimulate industry sector growth and to identify domestic and export opportunities. In addition to the directional policy matrix and product/market analysis, there are many other market strategy tools available for industry sector opportunities analysis. To serve as examples, these two tools are described in the context of the research structure.

The Product-Market Matrix

The product-market matrix categorizes company or industry sector growth strategies as follows: 1) market penetration (market the existing product to additional members of the existing market); 2) market development (market the existing product to new markets); 3) product development (market a new product to the existing market); and 4) diversification (market a new product to a new market). Multiple approaches are available to pursue each strategy (Kotler 1988). Product-market matrix growth analyses are applied to the area marketing and economic development component of the research.

Directional Policy Matrix

The directional policy matrix is another marketing strategic planning tool that assesses an organization's or industry sector potential for involvement in markets along two dimensions: competitive position and market attractiveness. For detailed reviews of the directional policy matrix, see Hofer and Schendel (1978), Hussey (1978), Robinson et al. (1978) and Wind and Mahajan (1981).

A desirable feature of the DPM is the flexibility it offers in selecting factors relevant to the specific industry to assess business sector prospects and competitive position. The DPM approach employs four sets of factors to assess business sector prospects-market growth rate, market quality, industry situation and environmental aspects. Competitive position is assessed based on market position, product research and development and production capability. The industry context in which the matrix is employed plays a major role in the choice of subfactors employed to relate business sector prospects and competitive position (Kerin et al. 1990).

Using these adaptations of generic market strategies, market based criteria are developed to assess potential wood products and industry segments long-term development potential (Table 1).

Table 1. Examples of Industry Development Assessment Criteria

- Ability to provide employment opportunities
- Available markets (local, regional, national or global)
- Capital requirements
- Competitive factors
- Complements existing businesses
- Consistency with manufacturing network strategy
- Consistency with overall economic development plans
- Distribution infrastructure- does it exist or can it be developed
- Environmental effects
- Manufacturing facility requirements
- Market growth rates
- Other economic benefits
- Pollution concerns (air, water, and noise)
- Raw material availability
- Waste facilities requirements (sewers, landfills)
- Workforce skill requirements

In application, these methods are used to do a “Comparative Product Sector Analysis”. In order to identify those market segments that hold the greatest promise for development, a comparison of criteria discussed earlier is conducted. For each of the criteria, a weight from 1 to 10 is assigned. This weighting scheme, which is consistent for all market segments analyzed, is developed from information gathered in the resource assessment, industry structure and market analysis sections of the research project as well as interviews with industry representatives. Given relative attractiveness of expansion or investment in different forest sector market segments, a logical next step is to discuss possible market strategies. Based on development of generic company-level market strategy options (Abell and Hammond 1979; Day 1986; Ohmae 1982), Figure 3 depicts the characteristics of each cell in the generic market strategy matrix.

Figure 3.

Generic Market Strategy Characteristics

Competitive Strength

		Competitive Strength		
		STRONG	MODERATE	WEAK
Market Attractiveness	HIGH	Extend Position	Invest to Build	Build Cautiously
		<ul style="list-style-type: none"> invest to grow at maximum digestible rate concentrate effort on maintaining strength 	<ul style="list-style-type: none"> challenge for industry leadership build selectively on strengths reinforce vulnerable areas 	<ul style="list-style-type: none"> specialize around limited strengths seek ways to overcome weaknesses withdraw if indications of sustainable growth are lacking
	MEDIUM	Build Selectively	Invest Selectively	Limit Expansion
		<ul style="list-style-type: none"> invest heavily in most attractive segments build ability to counter competition emphasize profitability by increasing productivity 	<ul style="list-style-type: none"> protect existing programs concentrate investments on segments where profitability is good and risk is relatively low 	<ul style="list-style-type: none"> look for ways to expand without high risk; otherwise minimize investment and rationalize operations
	LOW	Protect & Refocus	Harvest	Divest
		<ul style="list-style-type: none"> manage for current earnings concentrate on attractive segments defend strengths 	<ul style="list-style-type: none"> protect position in most profitable segments upgrade product lines minimize new investments 	<ul style="list-style-type: none"> sell at the time that will maximize cash value cut fixed costs and avoid investments

This marketing strategic characteristic matrix is applied to the forest products industry in the focal region.

Economic Effects of Forest Sector Development

Often, an important impact of overall value-added wood products development is to create new jobs and income sources for rural residents. A regional economic model provides estimates of income and job creation throughout the regional economy inclusive of and beyond the wood products sector (Figure 4). This component of the methodology focuses on estimating the impacts of feasible growth in the value-added forests products industry on the economy of the target region with an emphasis on the distributional consequences of this growth. The expectation is to provide policy makers with an idea of the sector's

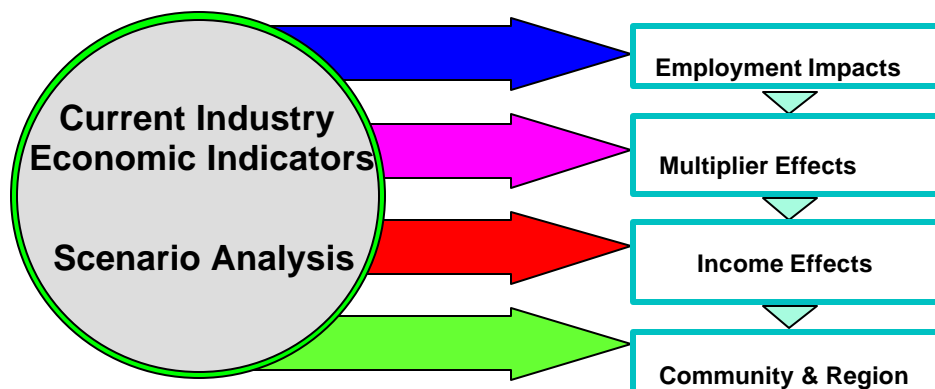
possible contribution to total economic activity and to income distribution in the region. Specific questions are:

⇒ What economic impacts result from forest based industry development?

⇒ What are the ramifications at the community, regional and state levels?

Figure 4.

Economic Impacts of Value-Added Wood Products Industry Development



Inter-industry models are a well-established procedure for examining the effects of the development of a particular industry on a regional economy. These sets of models include the more traditional input-output (I-O) model (Jensen 1987), the social accounting matrix (SAM) (2) and price flexible computable equilibrium models (CGE) (Berck et al. 1990). A recent advance in input-output models has been the development of so-called ready-made I-O models. Ready-made input-output modeling systems facilitate construction of non-survey input-output models for a given region or community by providing access to databases and model construction techniques within a single computer software package. One of the most widely used ready-made model building procedure is the IMPact Planning (IMPLAN) system, developed by researchers at the U.S. Forest Service (Alward et al. 1989).

Adapting ready-made models to a variety of uses has given rise to a group of input-output models known as "hybrids" (Jensen and West 1980). Hybrid models are input-output

models that have been constructed for a specific purpose or economy by verifying and when necessary changing the information in a ready made model based on secondary and primary data sources. The process of verification is particularly important to those concerned with sub-state or rural economies, because ready-made modeling systems draw on nationally developed coefficients.

In this methodology, a model is developed for the study area using IMPLAN. This model forms the basis for a hybrid input-output model. The latter model is based on unpublished state employment data, the regional information system (REIS) data provided by the Bureau of Economic Analysis, U.S. Bureau of the Census, other published information sources concerning the wood products industry and possible survey information collected in research studies. The hybrid I-O model will then form the basis for a regional SAM. The regional SAM and I-O models are, in turn, used in evaluating the impact of feasible growth scenarios in the forest product sector on the regional economy.

Social Structure and Work Readiness

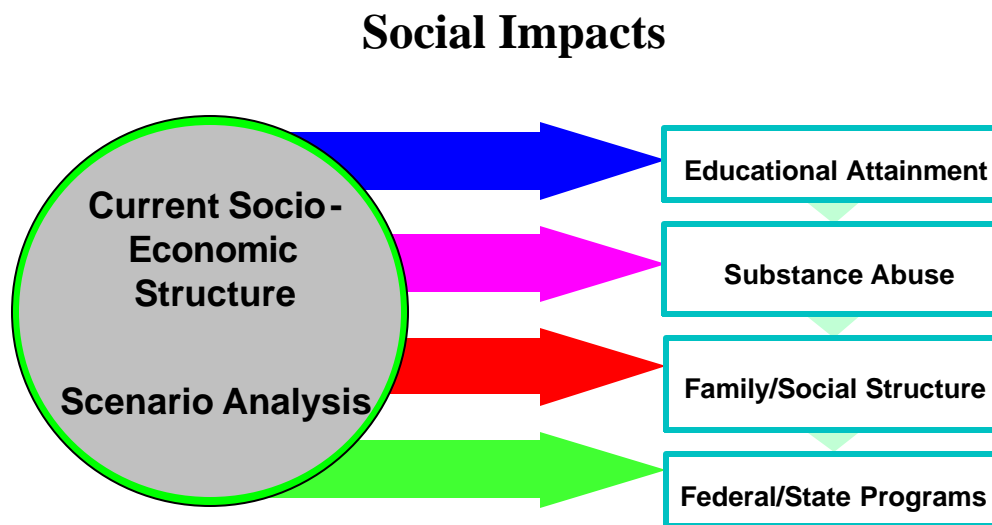
In any industry development strategy, it is important to examine the social structure of a community where jobs may be created. The social structure of a community allows for an understanding of education constraints, social stratification, economy and the knowledge base that already exists in this community. The decision to locate an industry to a particular location may not be based as much on the quality of the labor pool but on the natural resources within the particular area. Industries new to a region are concerned with the quality of the pool of potential workers. Often, when 'high tech' industries are introduced in a new location, the competence level of the residents is not adequate. In these instances, the industry is forced to look outside the immediate area and community for skilled workers during the early phases of development. Employee quality is affected by the social conditions that exist in the surrounding area.

This component of the research methodology describes the pool of eligible workers for the proposed value-added forest products industry in the target area. In addition, any uniqueness in the social structure or social institutions that exists and any potential

problems with workers that could influence the success of the value-added forest products industry are researched (Figure 5). Specific objectives in the context of social structure are:

1. Determine social and economic profiles for the study region.
2. Describe the pool of eligible workers in the area, including possible success rates.
3. Identify labor skill needs of existing companies as well as labor skill needs of companies operating in the high value-added secondary forest products industry.
4. Assist local policy makers in formulating strategies for implementation of rural economic development efforts designed to capitalize on defensible market driven opportunities in forest products industry sectors.
5. Assist local policy makers in developing a methodology for measuring the success of the local implementation of the rural economic development strategies formulated in the project.
6. Assess the suitability of introducing value-added industries to economically depressed areas.

Figure 5.



Using a micro-level approach, labor skill needs of existing companies as well as labor skill needs of companies operating in the forest products industry sector under study are identified. An inventory or profiling of the available labor pool, combined with industry skill requirement, leads to the establishment of training and development programs.

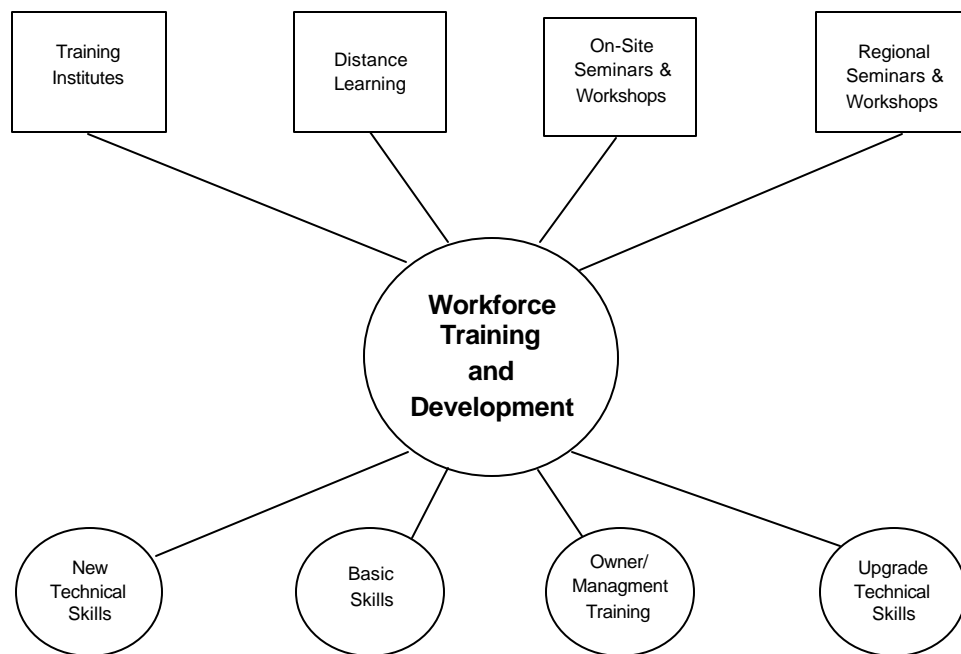
Employee Training & Development

Often, traditional educational systems provide little in the way of work force training and development for value-added forest products industries. For example, while there are programs under development in select locations in Louisiana for the pulp and paper

industry, largely developed by the industry for implementation in the technical college system, there remains a major gap in the skills needed by today's forest value-added wood products industry sectors. The need to focus a sustainable educational effort on existing labor, owner/managers and potential new industry employees remains critical and immediate. Figure 6 shows one structure for a value-added wood products industry training program. The main point is that such a program would be comprehensive and would draw upon the expertise and support that currently exists.

In order to reach as many owner/managers as possible, the methodology examines educational and training services utilizing varied media including formal classroom instruction, certificate courses, seminars and workshops, computer aided long distance learning and technical videos. In addition, outside expertise may provide specialized machine and process training. Training needs identified in current research include skilled, semi-skilled, business and production management, as well as basic skills and remedial support.

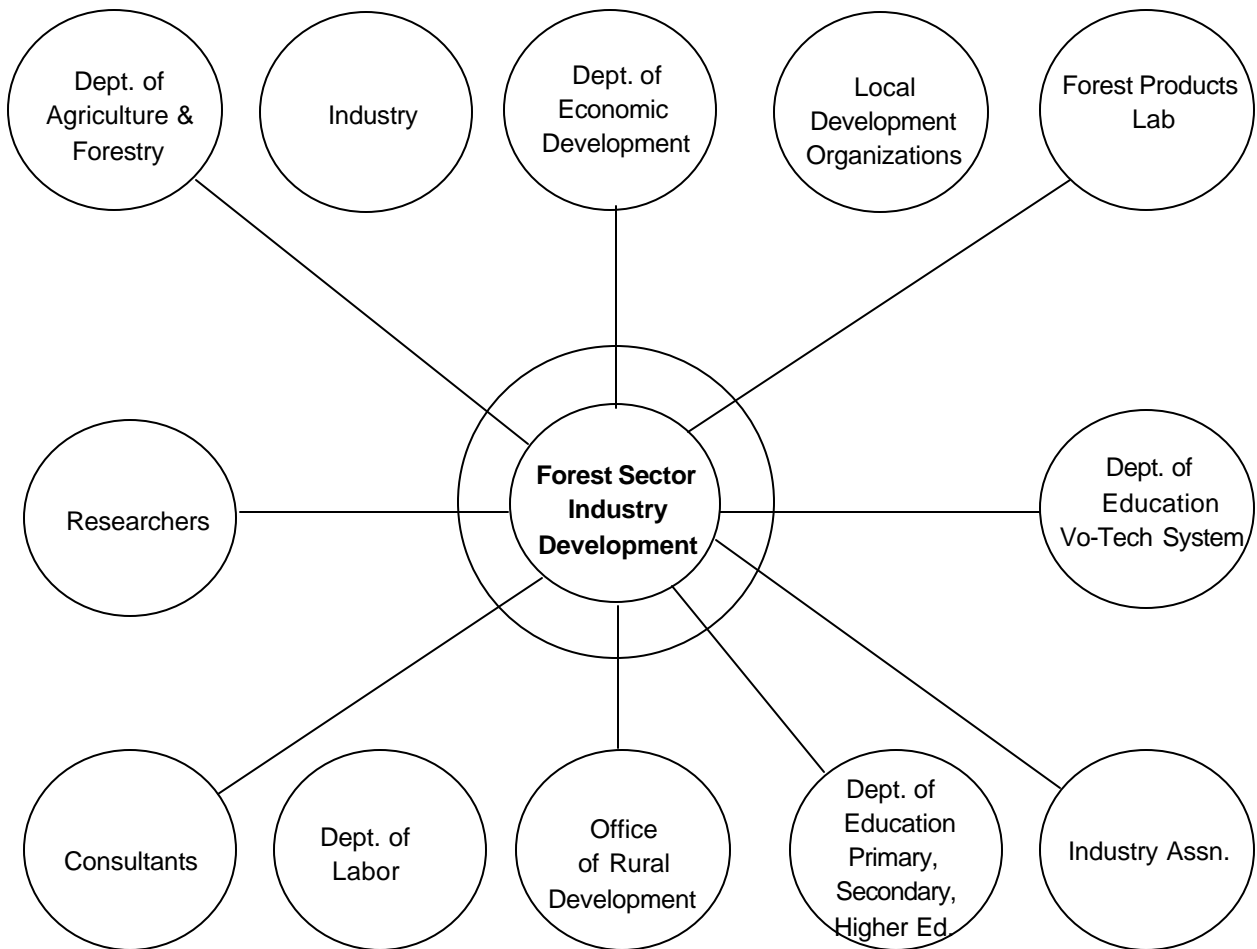
Figure 6. Workforce Training and Development Structure



Additional Methodology Components

Additional methodology components include an examination of community development issues such as stakeholder identification and interactions between stakeholders. The idea here is to develop an inclusive approach that encourages participation from members of the community. Other topics that are being examined through primary and secondary research are environmental issues (impacts, mitigation, regulations, etc.) and political issues (structure, proclivities, historical influences on industrial development, etc.) Although this methodology typically ends where policy maker implementation starts, the authors recommend that a collaborative structure for value-added forest sector development be established (Figure 7).

Figure 7. Forest Sector Development Collaborative Implementation Structure



Conclusions

By determining the varied dynamics impacting value-added forest products industries, this paper presents a comprehensive methodology for industry development. The nature of the methodology is such that during implementation phases, continued analysis and systematic follow-up allow for changes in demand, supply, market conditions, etc. and react in the short-term. Driven by market conditions, any new jobs created are likely to be maintained. This approach can assist local policy makers in formulating strategies for implementation of economic development efforts designed to capitalize on defensible market driven opportunities in forest products industry sectors.

By relying on a systematic approach, the suitability of introducing or expanding value-added forest-based industries can be better assessed than if a random approach is employed.

In this introduction, we have laid out a blueprint for sustainable value-added wood products industry development. It can be a foundation tool for policy makers and others that have a stake in adding value to forest resources.

References

Abell, Derek F. and John S. Hammond. 1979. Strategic Market Planning: Problems and Analytical Approaches. Prentice-Hall. Englewood Cliffs, NJ.

Adelman, Irma and Sherman Robinson. 1986. "U.S. Agriculture in a General Equilibrium Framework: Analysis with a Social Accounting Matrix." American Journal of Agricultural Economics, 68: 1196-1207.

Alward, G., E. Siverts, O. Olsen, J. Wagner, O. Senf and S. Linedall. 1989. Micro Implan Users Manual. Dept. of Agricultural and Applied Economics, University of Minnesota.

Anonymous. 1997. Louisiana Value-Added Wood Products Industry Development. Findings and Recommendations of The Governor's Forest Industry Development Task Force. Volume I Summary of Findings and Recommendations and Volume II Full Report of Findings, Recommendations and Supporting Materials. Submitted to: Mr. Kevin Reilly, Secretary Louisiana Department of Economic Development and Mr. Bob Odom, Commissioner Louisiana Department of Agriculture and Forestry.

Anonymous. 1994. Furniture Today. 1993 Annual Retail Marketing Guide.

Berck, Peter, Sherman Robinson and George Goldman. 1990. "The Use of Computable General Equilibrium Models to Assess Water Policies." Working Paper No. 545, Gianninni Foundation, University of California, Berkeley.

Bush, Robert J., Steven A. Sinclair and Philip A. Araman. 1991. Determinant Product and Supplier Attributes in Domestic Markets for Hardwood Lumber. Forest Products Journal. Vol. 41, No. 1. pp. 33-40.

Carriker, Roy R. 1988. Natural Resource Policies and Rural Development, Staff Paper 339, Food and Resource Economics Department, University of Florida.

Day, George S. 1986. Analysis for Strategic Market Decisions. West Publishing Company. St. Paul, MN.

Faulkner, Gary, Jim Gober, Jim Hyland, Ken Muehlenfeld, Steve Nix, Pat Waldrop and DeWayne Weldon, 1995. Forests of the South. Southern Forest Based Economic Development Council. June.

Forbes, Craig L., Steven A. Sinclair, Robert J. Bush and Philip A. Araman. 1994. Influence of Product and Supply Attributes on Hardwood Lumber Purchase Decisions in the Furniture Industry. Forest Products Journal. Vol. 44, No. 2. pp. 51-56.

Harding, O. Victor and W. Ramsay Smith, 1995. Woods of Louisiana. Louisiana Cooperative Extension Service, Louisiana Forest Products Laboratory, Louisiana State University, Baton Rouge, Louisiana.

Hofer, Charles W. and Dan Schendel. 1978. Strategy Formulation: Analytical Concepts, St. Paul: West.

Hussey, D. E. 1978. "Portfolio Analysis: Practical Experience with the Directional Policy Matrix," Long Range Planning, 11 (August), 2-8.

Jensen, R.C. 1987. "On the Concept of Ready-Made Regional Input-Output Models". Review of Regional Studies. 17: 20-25.

Jensen, R.C and G.R. West. 1980. "The Effect of Relative Coefficient Size on Input-Output Multipliers". Environment and Planning A. 12: 659-670.

Jones, Stephen B. and Mary Carol Koester. 1989. Evaluation of State and Interstate Programs to Encourage Forest Resource Based Economic Development, College of Forestry, Pennsylvania State University. University Park, Pennsylvania.

Kerin, Roger A., Vijay Mahajan and P. Rajan Varadarajan. 1990. Contemporary Perspectives on Strategic Market Planning. Allyn and Bacon. Needham Heights, MA.

Kotler, Philip. 1995. Marketing Management: Analysis, Planning, Implementation, and Control, 8th ed., Englewood Cliffs, NJ: Prentice-Hall.

Kotler, Philip. 1988. Marketing Management: Analysis, Planning, Implementation, and Control, 2nd ed., Englewood Cliffs, NJ: Prentice-Hall.

Luppold, William G. and Gilbert P. Dempsey. 1994. Factors Affecting Regional Changes in Hardwood Lumber Production. Forest Products Journal. Vol. 44, No. 6. pp. 8-13.

McKee, Daryl. 1989. Analytic Approaches to Strategic Marketing Planning for Area Economic Development. Journal of Macromarketing. Fall. pp. 32-43.

Ohmae, Kenneth. 1982. The Mind of the Strategist: The Art of Japanese Business. McGraw Hill. New York.

Robinson, S. J. Q., R. E. Hichens, and D. P. Wade (1978), "The Directional Policy Matrix--Tool for Strategic Planning," Long range Planning, 11 (June), 8-15.

Rosson Jr., James F., 1991. Forest Resources of Louisiana. United States Department of Agriculture, Forest Service. Southern Experiment Station. Resource Bulletin SO-192. June.

Skog, Kenneth. 1991. Supporting Rural Wood Industry Through Timber Utilization Research. Research Paper FPL-RP-506. U.S. Department of Agriculture, Forest Service, Forest Products Laboratory, Madison, WI.

Syme, John H. and Charles R. Duke. 1991. Forest Products Research Initiative for Abbeville and McCormick Counties in South Carolina. Final Report to the Savannah Valley Authority. Clemson University. December.

U. S. Census Bureau, U. S. Dept. of Commerce, 1995. 1992 Census of Manufactures. MA24T - Lumber Production and Mill Stock. August.

Vlosky, R.P., N. Paul Chance, A. Nicolas Koudou, Marc McDill and JoAnn Doucet. 1997a. "The Solid Wood Products Industry In The Macon Ridge Economic Development Region: Resource Assessment, Industry Structure and Potential Market Opportunities" Final Report to Sponsors. Louisiana State University Agricultural Center. Baton Rouge, LA. 190 pages.

Vlosky, R.P., A. Nicolas Koudou, N. Paul Chance, Marc McDill and JoAnn Doucet. 1997b. "The Louisiana Solid Wood Products Industry: Resource Assessment, Industry Structure and Value-Added Market Opportunities". Final Report to Sponsor: US Forest Service, Southern Experiment Station, New Orleans, Louisiana. Louisiana State University Agricultural Center. Baton Rouge, LA. 200 pages.

Wind, Yoram and Vijay Mahajan. 1981. "Designing Product and Business Portfolios," Harvard Business Review, 62 (January-February), 155-65.

**A Timber Resource Assessment of
Northwest Louisiana**

Richard Vlosky

N. Paul Chance

Introduction

This chapter provides an in-depth analysis of species, volumes, grades and ownership structure of the timber resources in the region. Sustainable forest management practices are needed in the region to ensure future supplies of raw materials are available for generations to come.

Throughout this section in discussing growing stock and sawtimber volumes, there are references to species groups. Table 1 defines the species included in each species group.

Table 1. Species list by Species group.

PINES

loblolly pine	longleaf pine	pond pine	shortleaf pine
slash pine	spruce pine		

CYPRESS

baldcypress	eastern redcedar	southern redcedar
-------------	------------------	-------------------

SOFT HARDWOOD

Allegheny chinkapin	American basswood	American chestnut	American elm
Kentucky coffee tree	September elm	black cherry	blackgum
box elder	butternut	catalpa	cedar elm
cottonwood	cucumber tree	hackberry	pumpkin ash
red maple	reedy	river birch	sassafras
silver maple	slippery elm	southern magnolia	sugarberry
swamp tupelo	sweetbay	sweetgum	water tupelo
white basswood	willow	winged elm	yellow-poplar

HARD HARDWOOD

American beech	American holly	American hornbeam	Chinese tallowtree
Delta post oak	Durand oak	Florida maple	Nuttall oak
osage-orange	paulownia	Shumard oak	apple sp.
bigleaf magnolia	black locust	black oak	black walnut
blackjack oak	bluejack oak	buckeye	chestnut oak
chinnaberry	chinquapin oak	chittamwood	common persimon
eastern hophornbeam	eastern redbud	flowering dogwood	green ash
hawthorn	hickory sp.	honeylocust	laurel oak
live oak	northern red oak	overcup oak	pecan
pin oak	plums, cherries	post oak	red mulberry
scarlet oak	serviceberry	shingle oak	sourwood
southern red oak	sparkleberry	swamp chestnut oak	swamp white oak
tung-oil tree	turkey oak	water hickory	water oak
water-elm	waterlocust	white ash	white mulberry
white oak	willow oak		

Red and White Oak Species Group Definitions

In the discussion of growing stock, reference is made to species groups not previously discussed. These groups, Select Red Oak, Other Red Oak, Select White Oak and Other White Oak, are defined in Table 2.

Table 2. Select Red Oak, Other Red Oak, Select White Oak and Other White Oak Species

Black Oak	Select Red Oaks
Cherrybark Oak	
Northern Red Oak	
Nuttal Oak	
Shumard Oak	
Laurel Oak	Other Red Oaks
Pin Oak	
Scartlet Oak	
Southern Red Oak	
Chestnut Oak	Select White Oaks
Chinquapin Oak	
Durand Oak	
Swamp Chestnut	
Swamp White Oak	
White Oak	
Delta Post Oak	Other White Oaks
Overcup Oak	
Post Oak	
Water Oak	
Willow Oak	

Major Species in the Region

Southern Yellow Pine *Pinus sp.*

The most plentiful species found in the region collectively are known as southern yellow pine. These species are used extensively in the production of paper and dimension construction materials. Because of increased global demand in paper markets and restrictions on softwood timber harvesting in the Pacific Northwest, pressure has increased on the South's pine resources. This impact on virtually all of the pulpwood, sawtimber and pole timber softwood resources is reflected on the resources data in the region.

American beech *Fagus grandifolia*

American beech grows in mixed hardwood bottomlands. It is a relatively low cost utility wood used primarily in flooring, furniture, handles and pallets.

Ash *Fraxinus sp.*

Because the smaller diameter classes are increasing, commercial availability of the species should continue for the foreseeable future. The wood from this species is used for cabinets, furniture, boxes, bats and handles (Harding & Smith 1995).

Baldcypress *Taxodium distichum v. distichum*

Decay resistance is a characteristic for which cypress is renowned. However, the sapwood of this species lacks the decay resistance of the heartwood. In order to develop sufficient heartwood to be commercially important would require the trees be allowed to grow to become very old. However, there is a growing market for cypress chips, mulch and economically priced solid wood furniture made from this species.

Boxelder *Acer negundo*

This bottomland species is usually found in conjunction with other species and is used as other low cost utility woods as firewood, in the production of turnings and some carvings.

Cottonwood *Populus deltoides*

This fast growing poplar is used in a number of applications including excelsior, boxes, pallets, caskets and upholstered furniture frames. Additionally, because of the white color of the wood and the length of the wood fiber, cottonwood is used in the production of paper. This species is the subject of significant research into short rotation fiber farming of fast growing timber species for use in the pulp and paper industry. Such research may offer an opportunity for reversion of unused or underutilized agricultural lands as global demand for pulp and paper increases.

Hickories and Pecans *Carya sp.*

This species includes the true hickories and pecans. Both groups have been depleted since 1984 and may not remain commercially significant. These species are used in the production of handles, dowels, furniture, cabinets and sporting goods (Harding & Smith 1995). It is likely these woods are harvested in conjunction with other species and represent incidental commercial opportunity.

Elm *Ulmus sp.*

American elm (*Ulmus americana*) and winged elm (*Ulmus alata*), which represent the soft elms, are used extensively in the production of crates, furniture, boxes and pallets.

Sweetgum *Liquidambar sp.*

Sweetgum is a utility wood found in abundance throughout the study region. Recently this species has been in demand for millwork, furniture frames, chips, marsh matting, crossties and pallets. This fast growing ubiquitous hardwood will likely continue to be an ample supply in the region for the foreseeable future.

Red oaks *Quercus Sp.*

Red oaks comprise a number of species found on a variety of sites. Upland sites produce cherrybark, shumard and northern red oak. Bottomland sites will produce southern red oak or swamp red oak, water oak, obtusa oak, willow oak and others. Cherrybark and shumard are the most valuable of these species. However, virtually all the red oaks have ready markets and consistent demand.

Depending on grade, color and mineral staining there is a wide price range as well as range of application for the wood of this species. Red oak wood is used in many applications from furniture and cabinetry to marsh matting and oriented strand board. The wood is often kiln dried and processed into dimension stock to be used for further value-added manufacturing and is available in lumber and veneer forms (Harding & Smith 1995).

Sugarberry *Celtis Laevagata*

Commonly called hackberry this wood is used in crates, pallets, furniture frames and inexpensive solid wood furniture and is available in lumber and veneer forms (Harding & Smith 1995).

Sycamore *Platanus occidentalis*

Sycamore is available in both lumber and veneer (Harding & Smith 1995). Because of the scarcity of the resource, utilization in veneers may extend the commercially viable life of the resource.

Tupelo/blackgum *Nyssa Sp.*

These utility woods are of limited commercial value to the region because of the limited quantity, difficulty of access to bottomland and flooded sites where these species grow and the relative low value of the wood. The wood is used in boxes, pallets, baskets and inexpensive furniture and cabinets (Harding & Smith 1995).

Water hickory *Carya aquatica*

This species is a bottomland species frequently found on flooded sites. It is a low quality wood with limited commercial value, primarily because of the wood's characteristics and the difficulty in logging. The larger size classifications are being logged. However, the removal rate appears to be low and relative to other bottomland utility woods there is significant inventory available.

White oak *Quercus sp.*

This valuable species grows in a variety of sites from upland areas to bottomlands. The species is valued for its ability to contain liquids and as a valuable cabinet and furniture wood (Harding & Smith 1995).

Willow *Salix sp.*

This bottomland species grows profusely along the banks of streams and rivers as well as other low lying areas throughout the region. Willow is a relatively low cost wood and is used much like other utility woods in crates, low cost furniture, excelsior and caskets.

Yellow poplar *Liriodendron tulipifera*

The wood from this species is moderately expensive and is used in such applications as millwork, furniture, cabinets and caskets (Harding & Smith 1995).

Forest Types

The ten parish study region covered in this report represent 15.6% of the parishes of Louisiana. However, timber lands in the region account for approximately 3.6 million acres or nearly 26% of the total 13.9 million acres of forested land in Louisiana. The reader is reminded that the data presented is from a 1991 source. It is however, the most recent data available.

Predominant species found in the region includes about 2.37 million acres of southern yellow pine and oak, 691 thousand acres of upland hardwood species such as oak, hickory and sweetgum and about 535 thousand acres of bottom-land species such as water oak, tupelo gum and cypress.

Sabine parish is reported to have the greatest volume of softwood while Natchitoches parish contains the greatest volumes of hardwood species. When combine Natchitoches parish has more timber land than any other parish in the study region.

Figure 1 shows forestland by parish in the region. Figures 2 and 3 break forestland down further by species group, by parish.

Figure 1.

1991 Northwest Forestland Area by Parish

Parishes Ranked By Acreage
(thousands of acres)

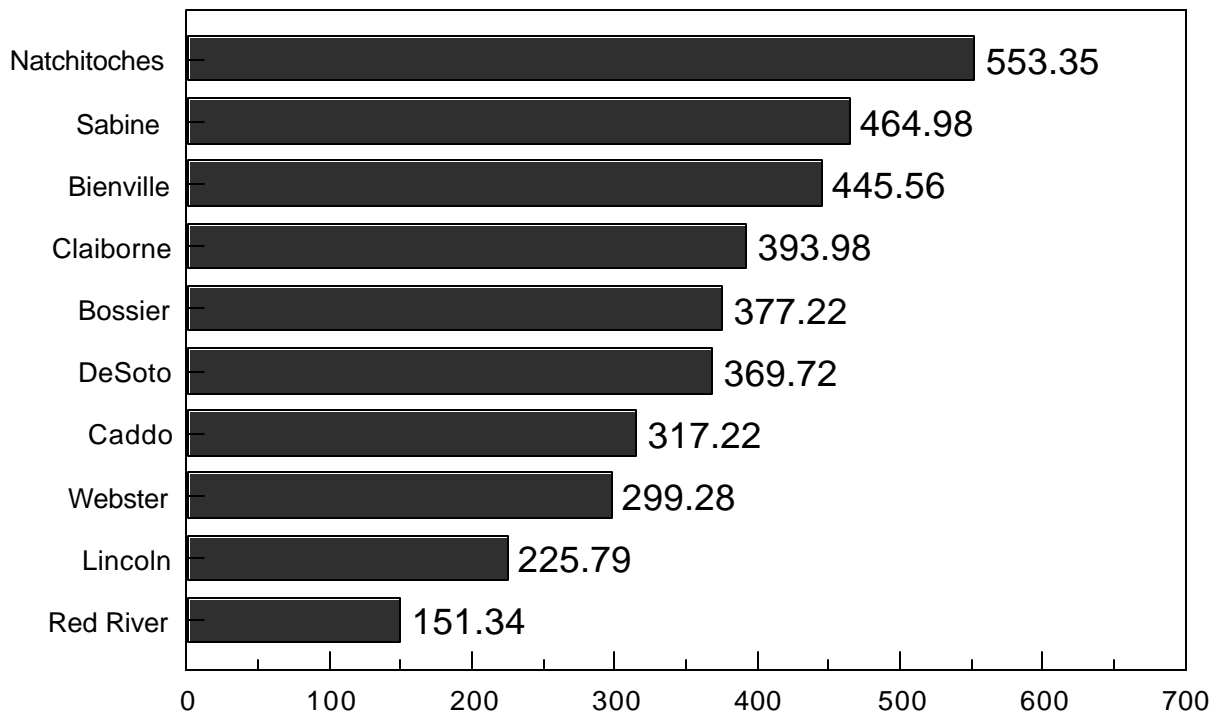
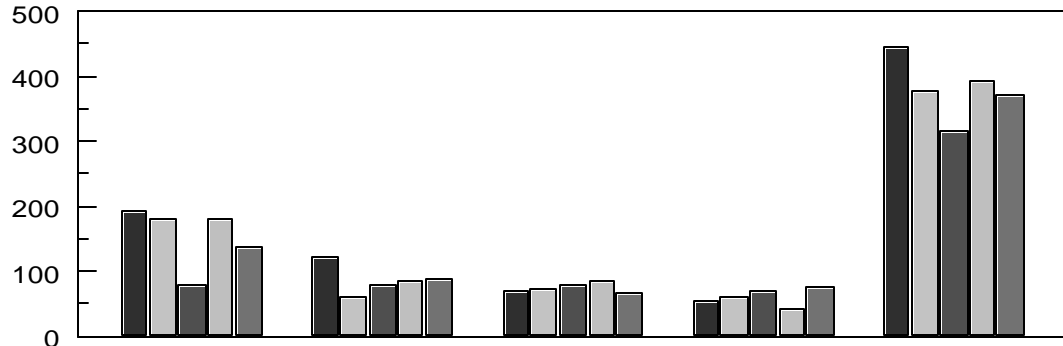


Figure 2.

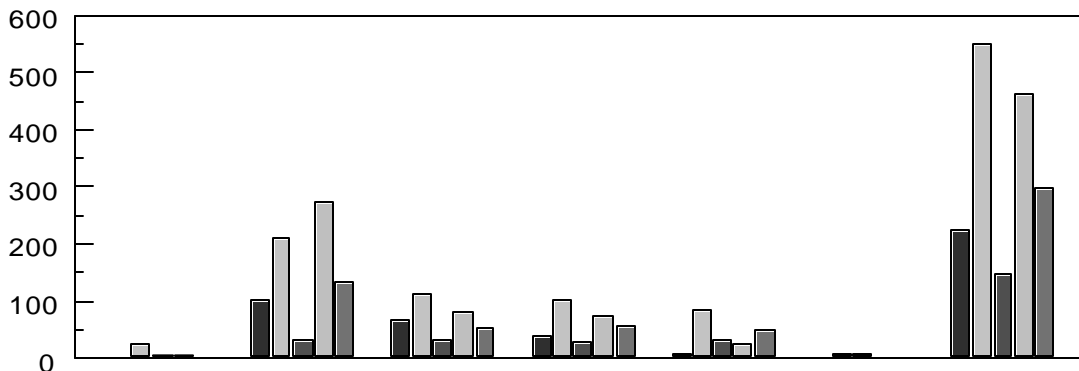
1991 Northwest Forestland Area By Species Group By Parish (thousands of acres)



	loblolly/shortleaf	oak-pine	oak-hickory	oak-gum-cypress	total
Bienville	194.93	122.53	72.40	55.70	445.56
Bossier	183.22	59.28	75.44	59.28	377.22
Caddo	82.04	82.04	82.04	71.10	317.22
Claiborne	182.46	84.31	85.06	42.15	393.98
DeSoto	137.95	88.29	66.22	77.25	369.72

Figure 3.

1991 Northwest Forestland Area By Species Group By Parish (thousands of acres)



	longleaf/slash	loblolly/shortleaf	oak-pine	oak-hickory	oak-gum-cypress	elm-ash-cottonwood	Total
Lincoln	0.00	104.21	69.47	40.53	11.58	0.00	225.79
Natchitoches	27.45	209.45	116.49	104.09	84.74	11.13	553.35
Red River	5.82	34.92	34.92	29.10	34.92	11.64	151.34
Sabine	6.28	276.47	81.69	75.40	25.13	0.00	464.98
Webster	0.00	132.80	56.30	60.14	50.04	0.00	299.28

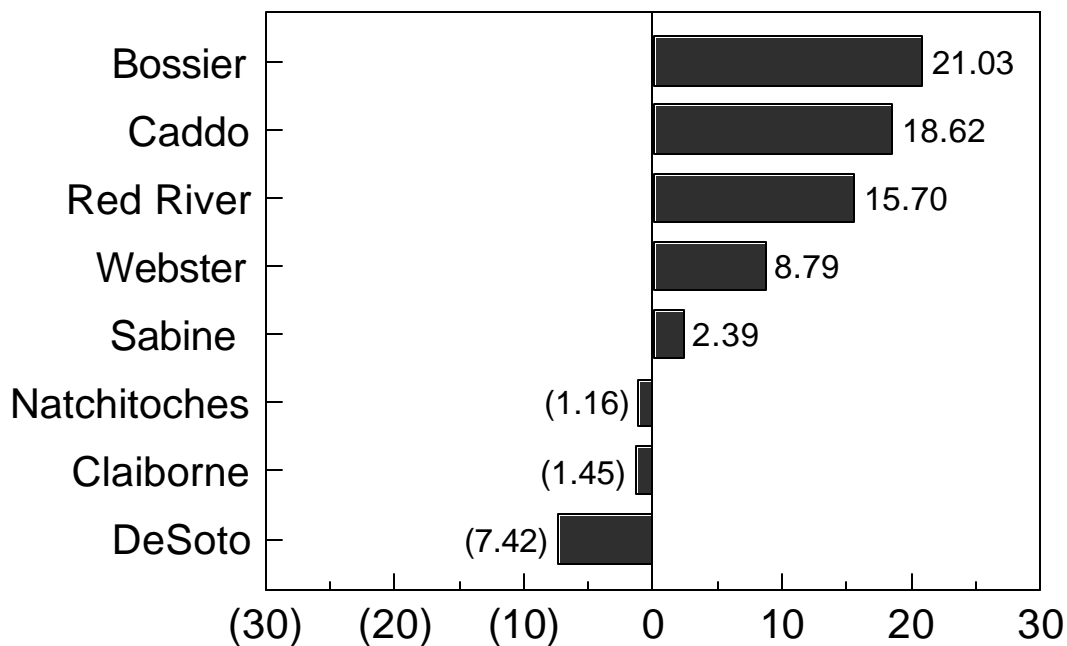
Changes in Forestland Areas

Figure 4 indicates that most parishes in the region have seen increases in their respective volumes of forestland in the period between 1984 and 1991. In, Bossier, Caddo and Red River, the increases have been significant. Only Claiborne, DeSoto and Natchitoches experienced a decrease in the number of acres of forestland over this time period. The data does not indicate the reasons for the decrease and may include lands that have been reclassified for any number of reasons and land use shifts.

Figure 4.

1991 Northwest Forestland Area by Parish

Change in Acreage 1984-1991
(thousands of acres)



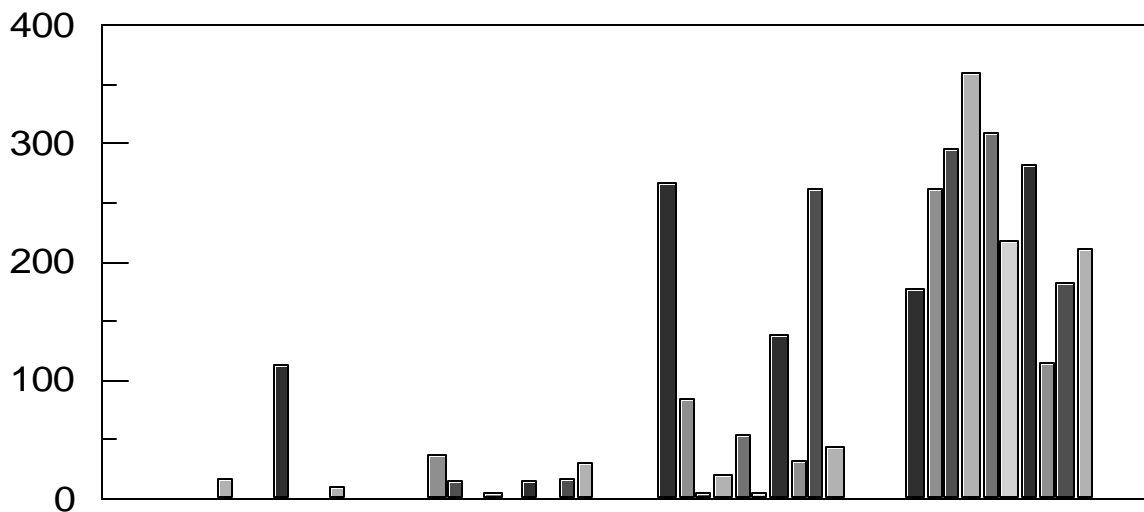
Overall the region has seen an increase of over 56 thousand acres of forestland. Data were not available for Bienville and Lincoln parishes. In addition, the reader is advised that the increase in forestland area does not necessarily mean that these lands currently contain commercial volumes of timber.

Land Ownership Patterns

Figure 5 shows the ownership structure of forestlands in the study region. In Natchitoches parish federal land ownership in the form of national forests represent a significant portion of the total forestland in the parish. Region-wide national forests and other forms of public sector ownership in total represent a much smaller portion of the total forestland ownership than any other group. Private land holding are nearly 2.5 times that of forest industry holdings, which in turn is over 3 times the size of total public sector holdings. This ownership structure may be significant in terms of the availability of raw materials as well as the rate at which timber resources, once harvested are replanted.

Figure 5.

1991 Northwest Forestland Area By Ownership By Parish (thousands of acres)



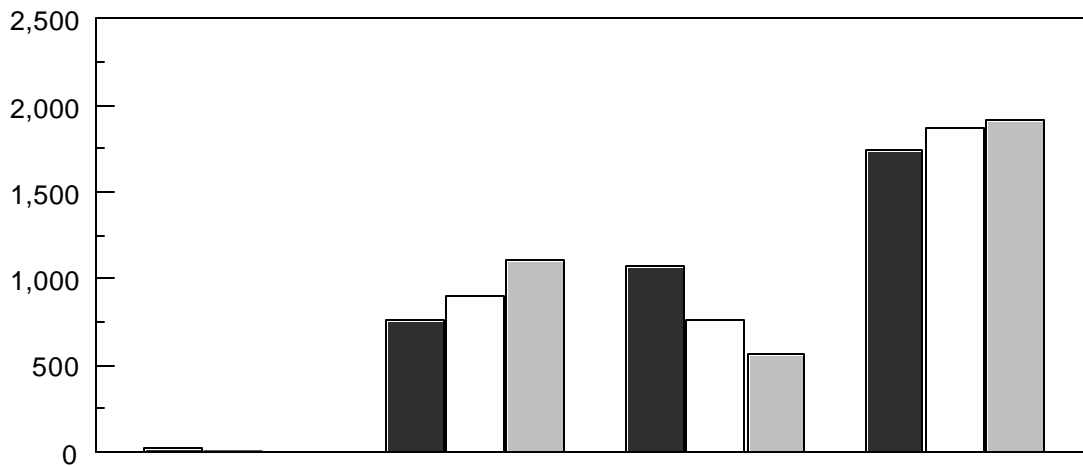
	National Forest	Other Public	Forest Industry	Private
Bienville	0	0	267	178
Bossier	0	38	86	264
Caddo	0	16	5	295
Claiborne	17	0	20	360
DeSoto	0	6	55	309
Lincoln	0	0	6	220
Natchitoches	114	17	139	284
Red River	0	0	35	116
Sabine	0	19	264	182
Webster	12	31	44	213
Total	143	126	921	2,422

Timber Stand Size Class

Figure 6 shows that all size class volume except pole timber has increased over the 1974-1984-1991 time periods. This finding is important given the conventional wisdom that holds that private landowners are less likely to replant once they have harvested the commercial timber on their lands. However, because the amount of understocked lands has been significantly reduced at the time the data was recorded and all other size class volumes have increased except pole timber, the future of available timber resources in the region seems secure. Pole timber, a valuable class size has been reduced by nearly half. However, sawtimber, if allowed to continue to grow, could easily restore volumes removed or depleted.

Figure 6.

1991 Northwest Forestland Area By Size Class By Year (thousands of acres)



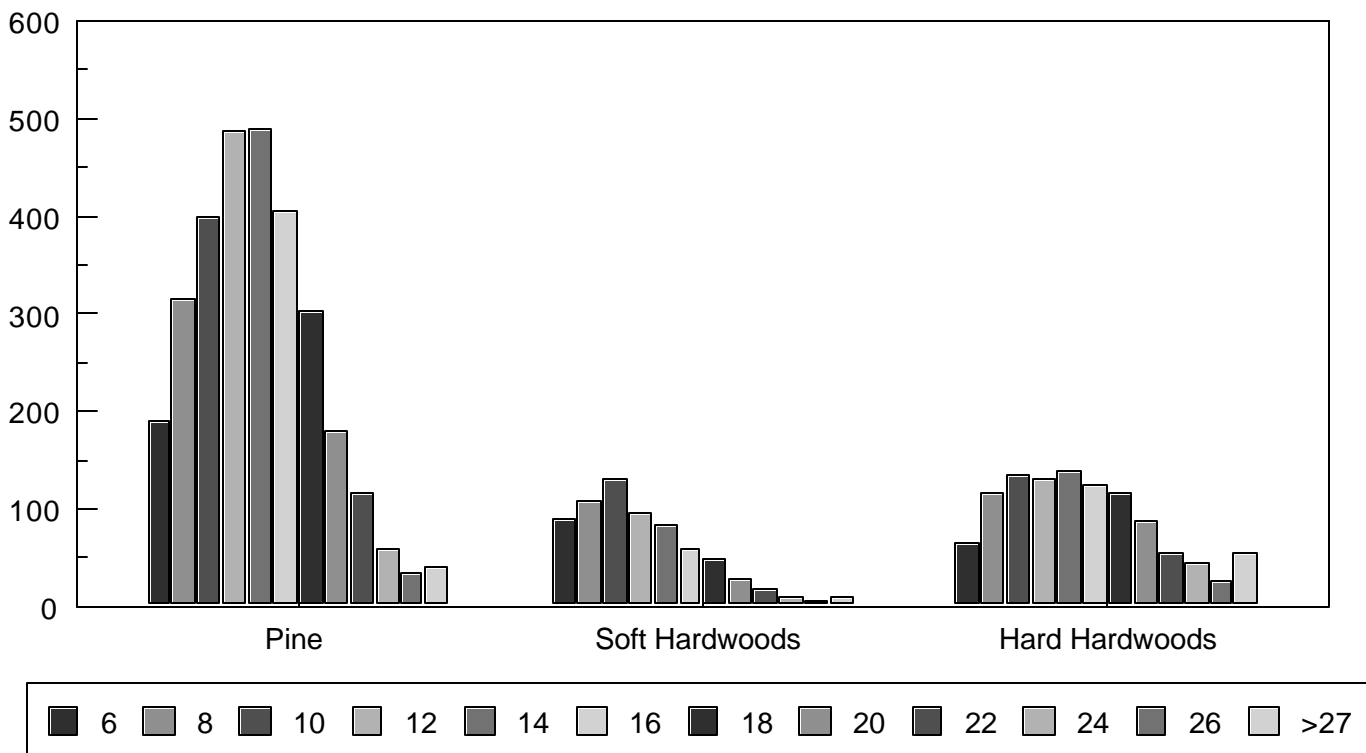
	understocked	seedling/sapling	poletimber	sawtimber
1974	27	768	1,079	1,750
1984	5	905	756	1,880
1991	0	1,115	579	1,918

Growing Stock Volumes

Typical of timber resources in the South in general, the diameter growing stock in the region is largely 16 inches and less (Figure 7). Companies interviewed in the region which use the timber or process the timber resources in log form, report a shift in processing technologies which take advantage of these smaller bole diameters. The distribution of size class structure holds for all types of timber in the region.

Figure 7.

1991 Growing Stock Volume By Diameter Class and Species Group (million cubic feet)



Changes in Growing Stock Volumes

Significant depletion of growing stock volumes has occurred between 1984 and 1991 in most timber groups and species, especially in the smaller diameter sizes. This is very interesting since Figure 8 indicates that the volume of pine growing stock far exceeds other timber groups. Especially hard hit has been the smaller diameter pines and hard hardwoods. This trend may reflect increased utilization of smaller trees in the production of pulp and chips. The present use of small diameter trees may have significant impact on the availability of future supplies of sawtimber as well as the quality of those future supplies.

Figure 8.

Change in Growing Stock Volume By Diameter Class and Species Group 1984-1991 (million cubic feet)

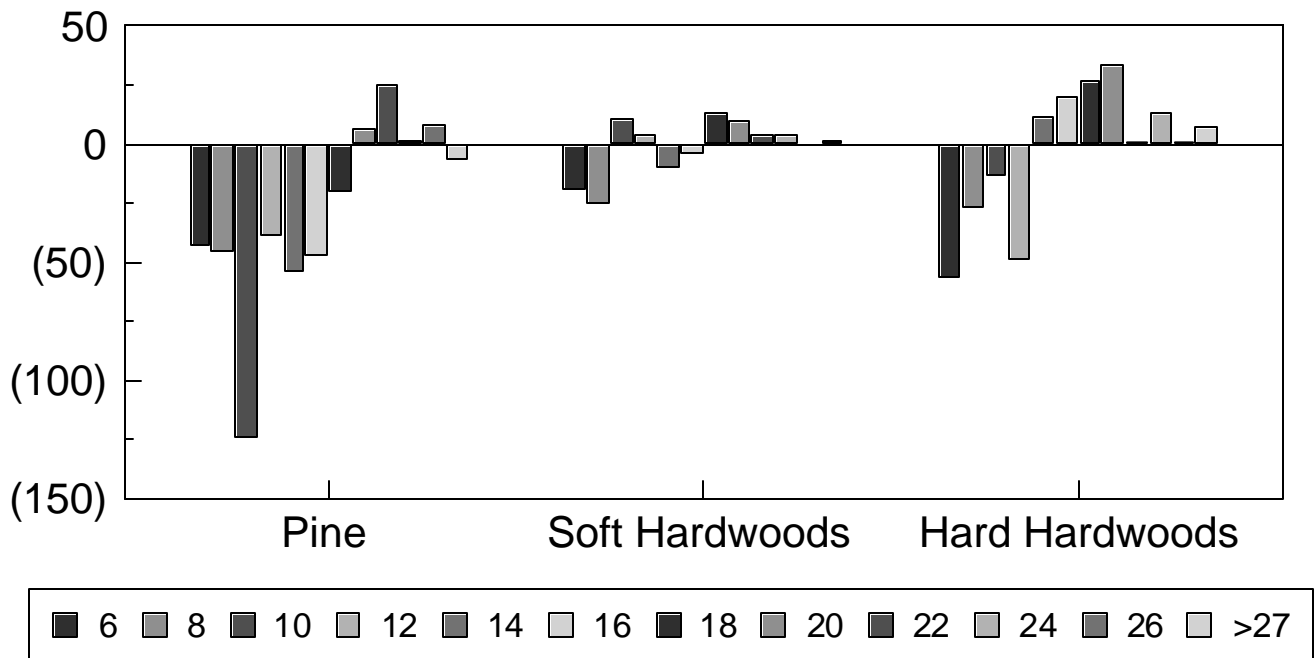
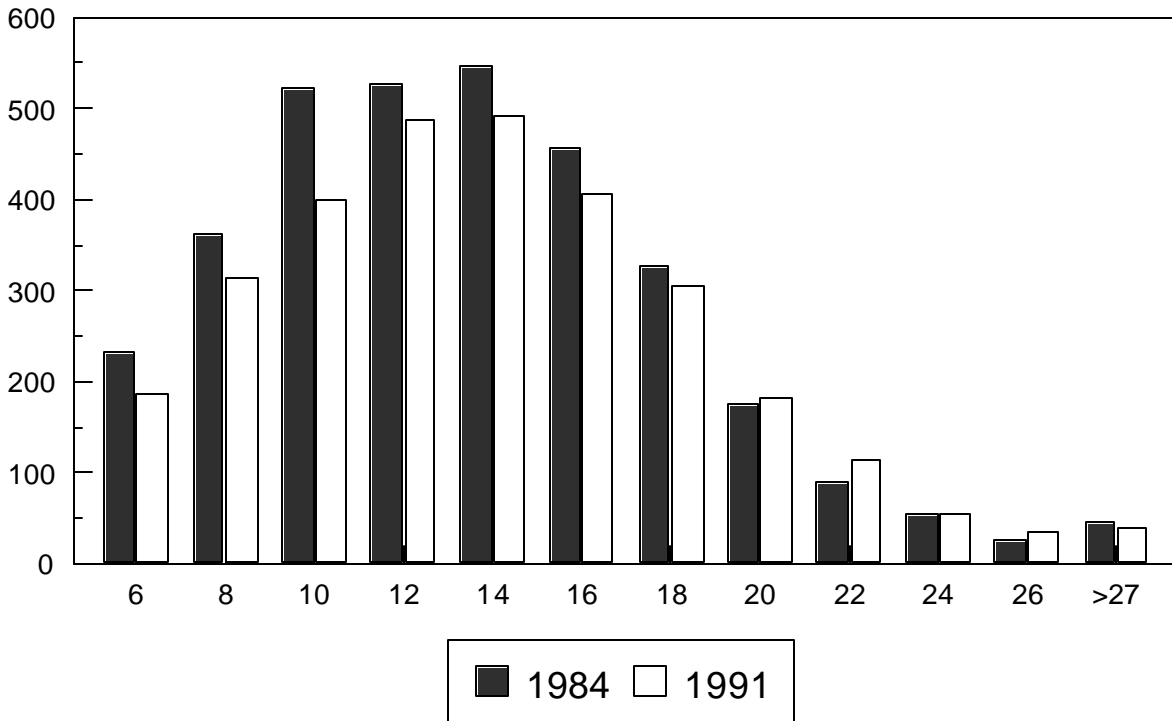


Figure 9 provides further evidence of the depletion of small diameter softwood resources from 1984 through 1991. Virtually all size classification volumes have been reduced. The current rate of harvesting is reported by most companies interviewed to continue for the foreseeable future. These managers all felt that there would be ample supplies of materials, yet no concrete evidence of this was offered by anyone participating in the interviews. Interestingly, one large producer of veneered panel products in the region has recently closed down one of its operations, citing competition for scarce resources as the reason for closing the plant. However, the same company has again announced the closed plant will be utilized in another secondary processing application.

Figure 9.

Change in PINE Growing Stock Volume By Diameter Class 1984-1991 (million cubic feet)



Hardwood Growing Stock Volumes

Figures 10 and 11 indicate the same condition concerning the distribution of hardwood growing stock class sizes which is prevalent amongst softwood species. In both cases, small diameter trees are in greater quantity and these volumes have increased since 1984. These data are important again because they reflect the relative quality and potential value of the resource and predetermine the types of applications for which the resource is best suited.

Figure 10.
Change in SOFT HARDWOODS Growing Stock Volume
 By Diameter Class 1984-1991
 (million cubic feet)

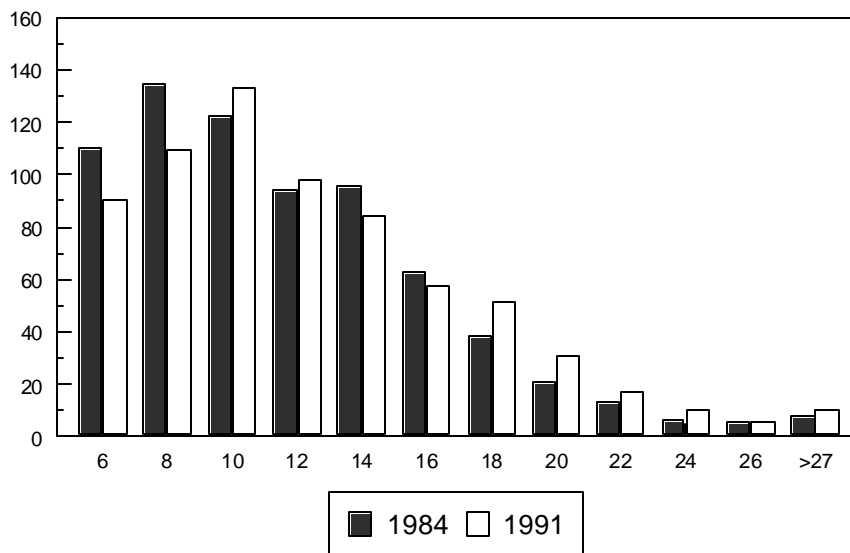
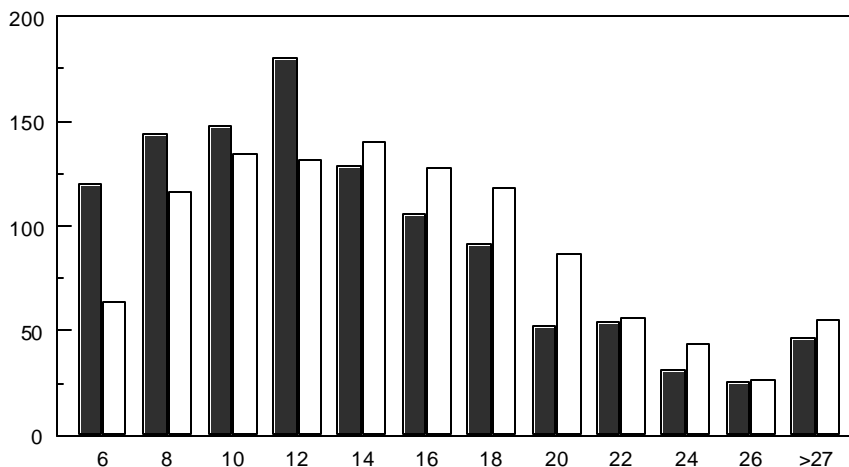


Figure 11.
Change in HARD HARDWOODS Growing Stock Volume
 By Diameter Class 1984-1991
 (million cubic feet)



These small diameter trees indicate that the timber will likely be of reduced quality and therefore bring less in the market than larger diameter. In addition, these resources may not currently be appropriate for high value-added applications. Depending on the needs and wants of the owners of these resources, future supplies of hardwood resources may be affected if the existing hardwood timber stands of immature trees are sold for chips and paper production.

Growing Stock Volume by Species - 1991

Softwoods, predominantly loblolly and shortleaf pine make up the largest group of timber in the region. Sweetgum is the most abundant hardwood with classifications of white and red oak dominating other species. These timber groups are all of very high commercial value and comprise hundreds of millions of cubic feet of materials with which to create products and hence jobs and economic opportunity.

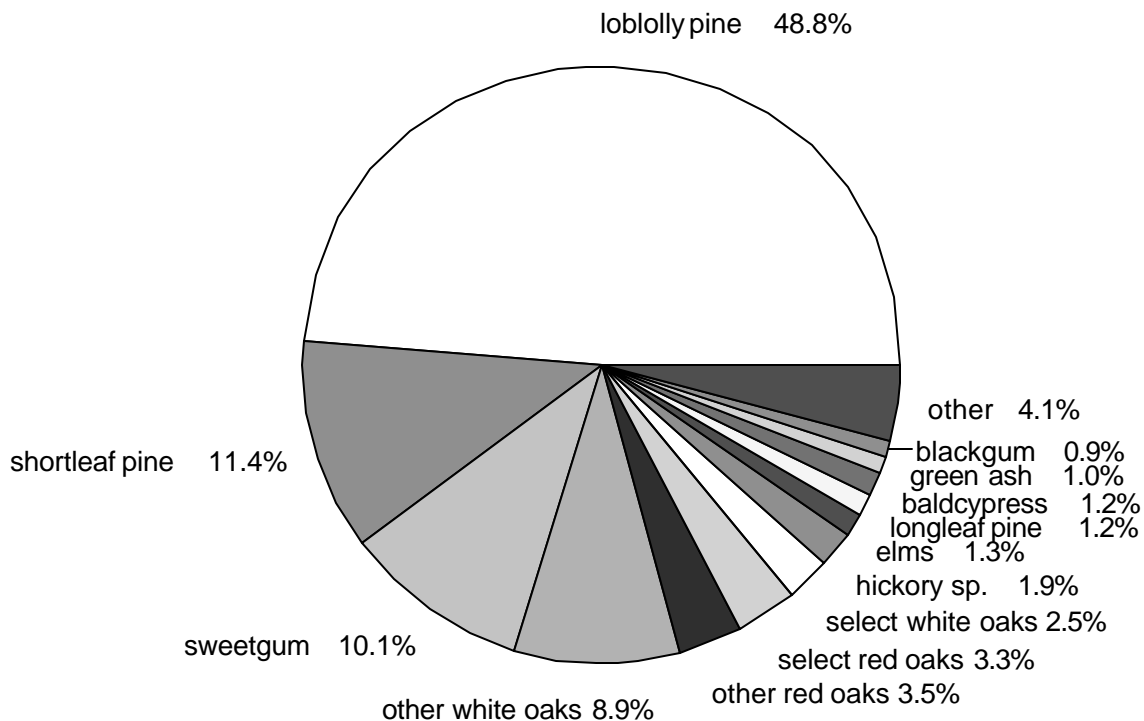
Figure 12 shows the distribution of growing stock by species in the region. This distribution is similar to data for the entire state of Louisiana. In both cases, softwood species dominate the landscape in volume and acreage.

Figure 12.

1991 Growing Stock Volume by Species

(cubic feet)

Total= 4,842,553,835



Sawtimber Volumes

(Sawtimber figures are presented for the region as a whole. Data for individual parishes can be found in Appendix A.)

Figure 13 shows 1991 volume by diameter class for pine, soft hardwoods and hard hardwoods. Figure 14 indicates that while there have been reductions in the smaller diameter saw timber size classes, larger diameter sawlogs, both softwood and hardwood, have increased over the 1984-1991 time period. This also would tend to lead to the expectation that there are notable quantities of high quality timber available for utilization in the region. This expectation is validated by Figure 15 that shows that saw timber quality is dominated by grade 3 and higher.

Figure 13.

1991 Sawtimber Volume By Diameter Class (billion board feet)

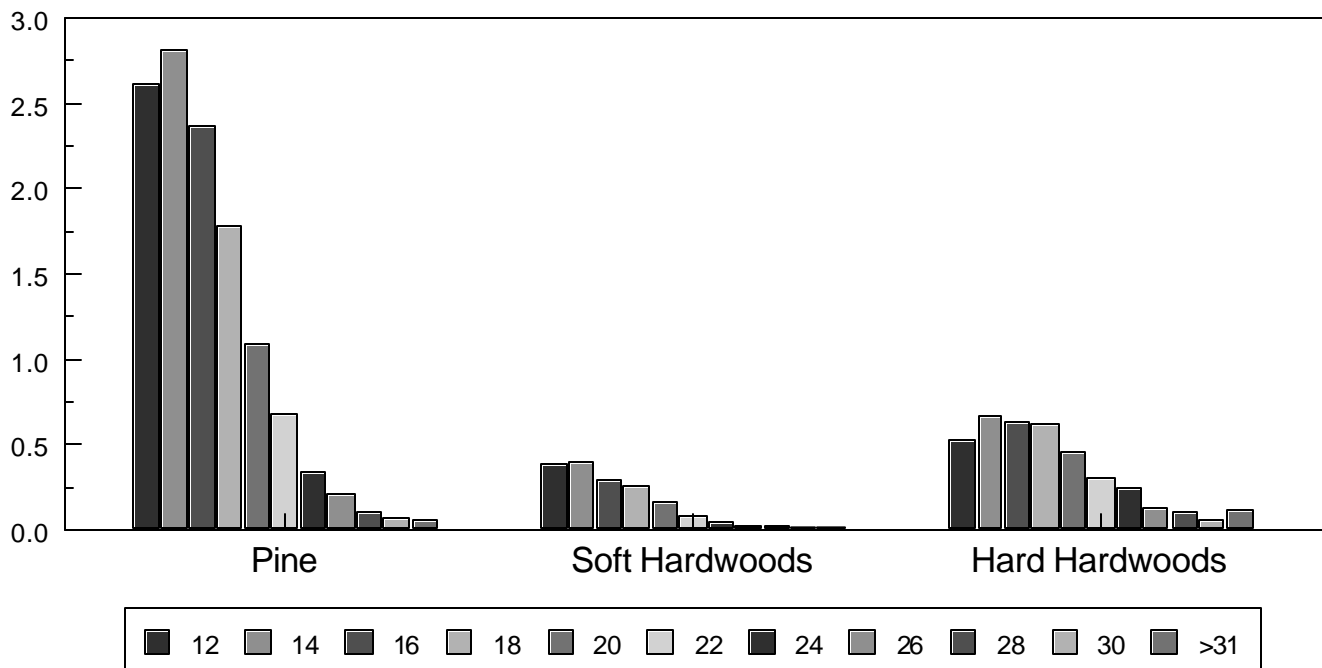


Figure 14.

Change in Sawtimber Volume 1984-1991 By Diameter Class and Species Group (billion board feet)

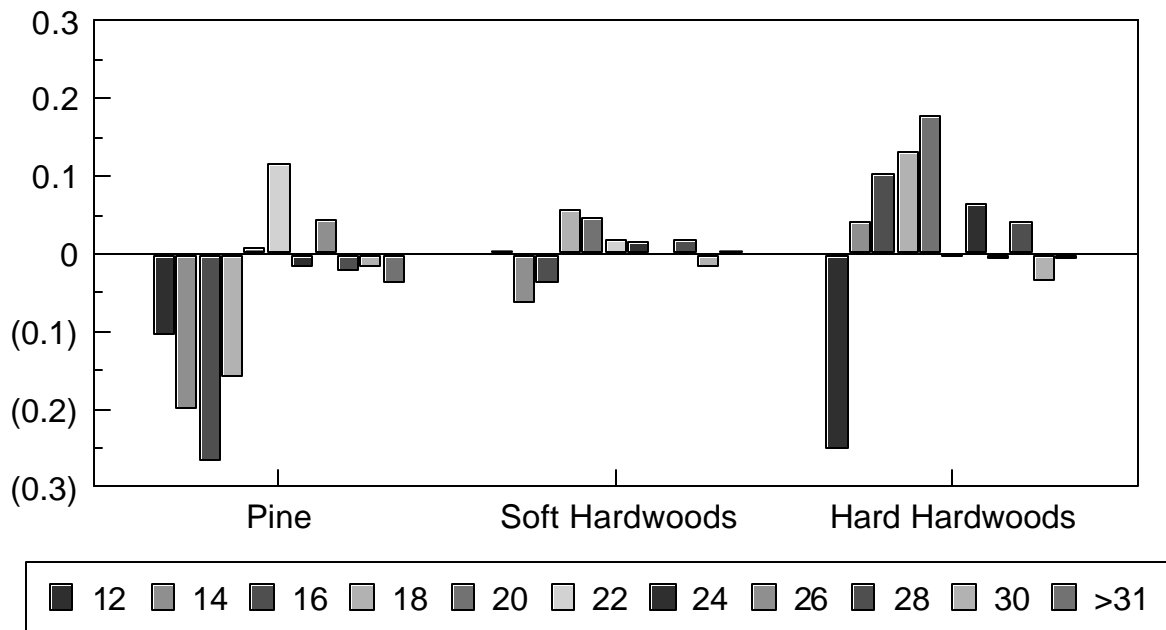
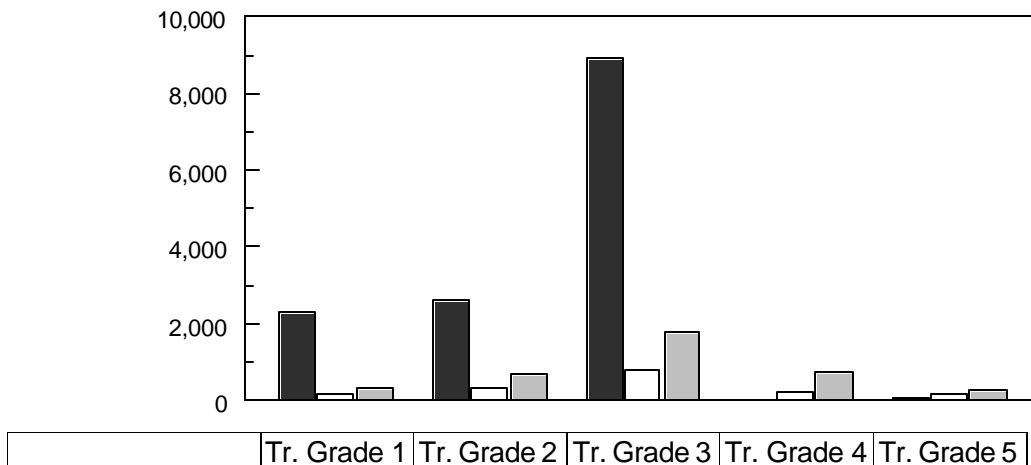


Figure 15.

1991 Sawtimber Volume by Grade Total: All Parishes (million board feet)

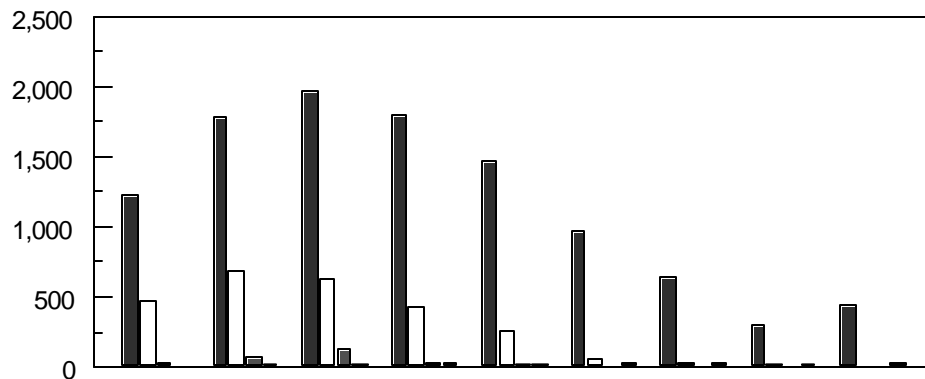


The trend in high grade sawtimber is reflected throughout the available for each parish in the study region. However, the reader should consider the importance of bole diameter as a factor in the grade distribution. Previous graphs demonstrate the preponderance of small to medium sized trees

Figures 16 and 17 again demonstrate the volume of sawtimber by diameter size in the study region for softwood and hard wood species, respectively. The data for both softwood and hardwood species indicate the shape of the distribution curve is skewed to the left or smaller diameter sizes.

Figure 16.

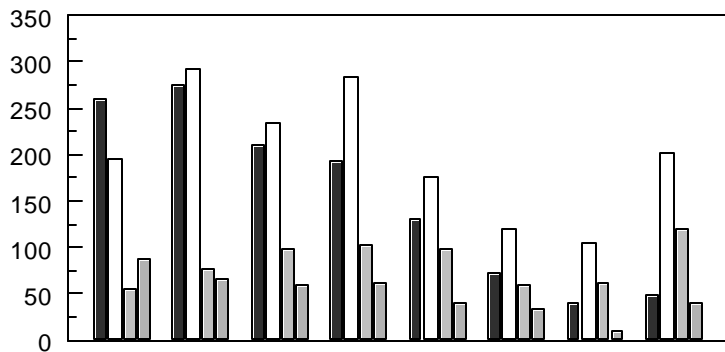
1991 Softwood Sawtimber Volume By Species and Diameter Class (million cubic feet)



	10	12	14	16	18	20	22	24	>26
loblolly pine	1,227	1,786	1,975	1,809	1,487	981	652	314	457
shortleaf pine	470	694	645	445	262	61	38	24	10
slash pine	35	70	130	49	23	8	3	0	0
bald cypress	7	25	26	41	26	38	34	25	49
Total	1,739	2,574	2,776	2,344	1,797	1,088	727	363	515

Figure 17.

1991 Hardwood Sawtimber Volume By Species and Diameter Class (million cubic feet)



	12	14	16	18	20	22	24	>26
sweetgum	262	278	211	194	131	74	42	50
other white oaks	196	295	234	285	177	123	107	201
select red oaks	57	76	101	106	100	60	61	121
select white oaks	89	67	59	62	41	33	11	41
Total	604	716	605	646	449	291	221	413

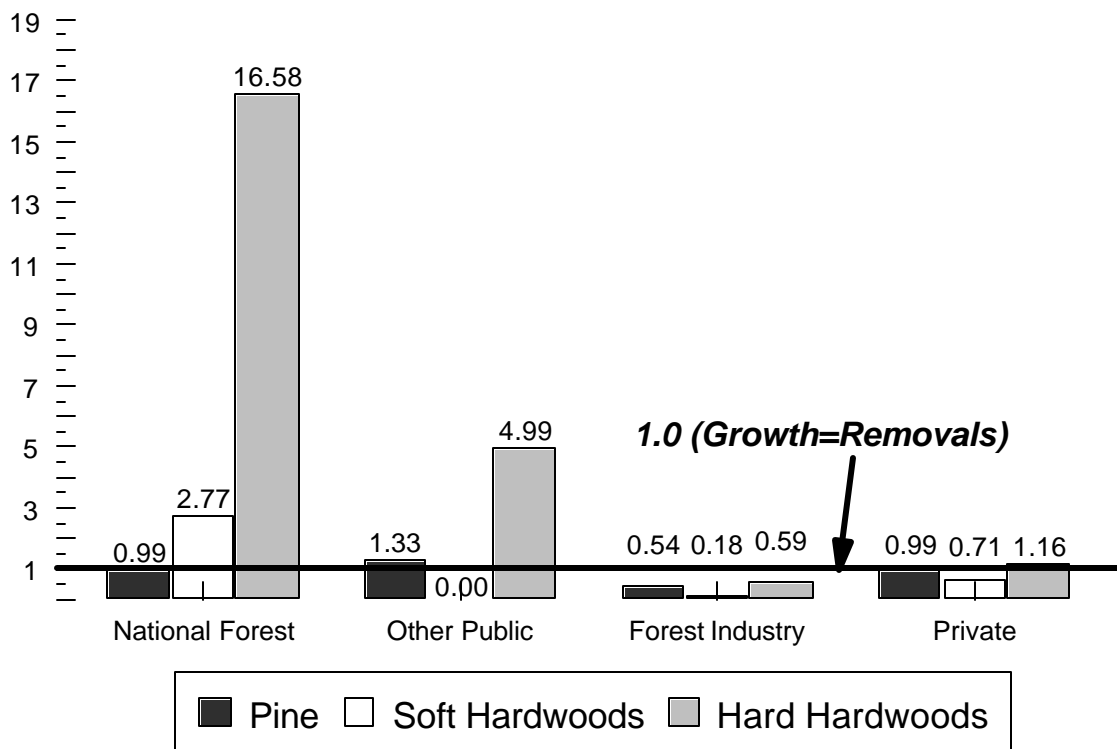
Growth/Removal Ratios by Ownership and Species Group

(Growth/removal figures are presented for the region as a whole. Data for individual parishes can be found in Appendix A.)

Figure 18 indicates that in 1991 only hard hardwood on other public lands was experiencing greater rates of removal than replacement. In the same ownership group, soft hardwood species were reported at a break even rate of growth/removal exists. The ratio of growth over removal for hard hardwoods on national forests was significant. All other species groups on all other land ownership categories show positive growth/removal ratios indicating that at the time the data was collected harvesting activities in the region were not depleting the resource faster than the resource was being replaced.

Figure 18.

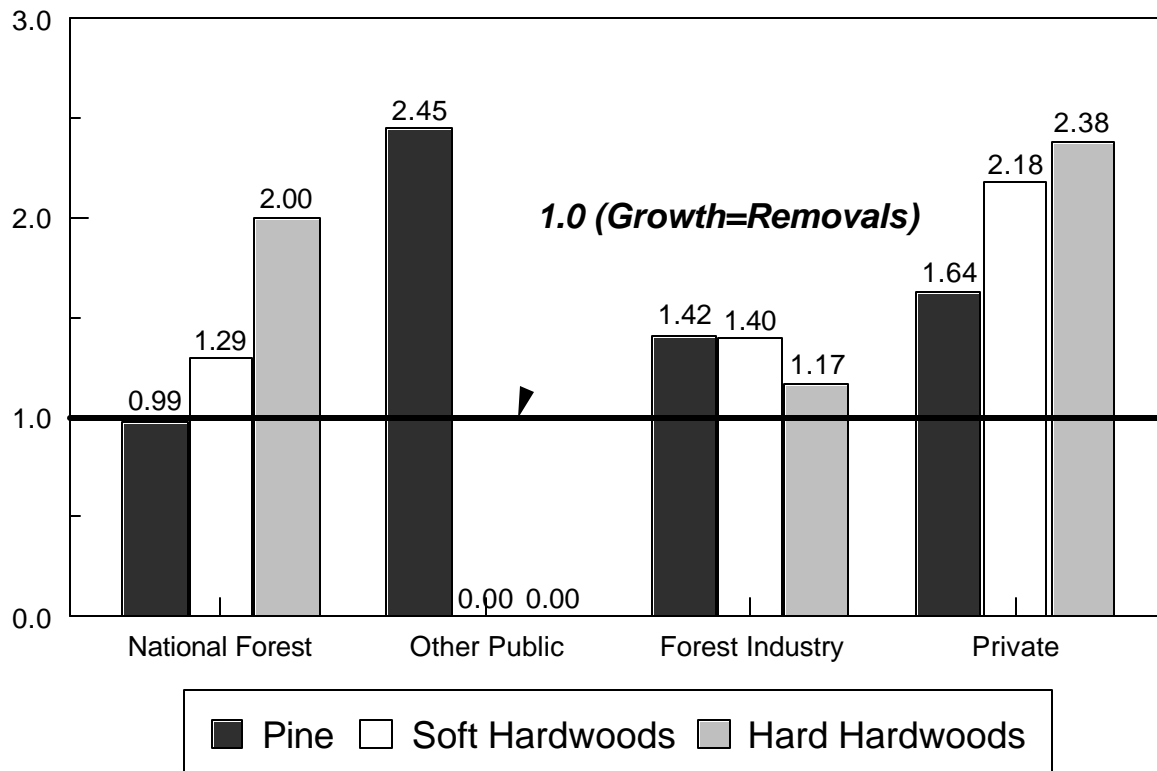
1991 Growth/Removal Ratios of Sawtimber by Ownership and Species Group



However, as good as this may seem, when the study region's 1984 growth/removal ratios is compared to 1991 data one can readily see that harvesting activities have during the 7 year period increased dramatically in most ownership classes (Figure 19). Data on growth/removal ratios since 1991 are currently not available. However, the reduction in the growth/removal ratios for the region indicates that severe harvesting pressure was being placed on the resource. As soon as more recent data comes available, policy makers may wish to have this analysis conducted again in order to make decisions and policy recommendations concerning regeneration incentives and harvesting activities.

Figure 19.

1984 Growth/Removal Ratios of Sawtimber by Ownership and Species Group



Adjacent Timber Resources

As important as the existence of commercially viable timber resources within the region may be, perhaps even more important is the existence of timber resources within viable transportation distances around the study region. For the purposes of this study, this is roughly 100 miles from the region's boundary. Accordingly, data was developed for timber resources in Louisiana, Mississippi and Arkansas for all parishes and counties that impinge any point within one hundred miles of the borders of the study region.

Louisiana-Adjacent Parishes

In this section the authors have investigated the timber resource situation in Louisiana parishes adjacent to the study area. Earlier research (insert cites) as well as field site visits conducted for the current project has found that significant quantities of timber are brought into the region from up to 100 mile distance for processing into peeled logs, lumber, panel products, chips and pulp. This industry activity then requires that the timber resource situation in these parishes be investigated to assess the possible impact of future supplies. The seven parishes investigated include Grant, Jackson, Quachita, Rapides, Union, Vernon and Winn. Because of the statistical nature of the data presented we will focus on cumulative data and not present data from individual parishes except in the event of extraordinary data worthy of mention.

Forestland Acreage

The seven parishes included in this section have an estimated total of 3.28 million acres of forestland; approximately 1.6 million acres of southern yellow pine, 1.14 million acres of upland hardwood and another 536 thousand acres of bottomland species. The data indicates the predominance of southern yellow pine in the region.

The distribution of forestland in these parishes indicates that Vernon, the southern most parish, contains the highest number of acres of forestland, with Quachita parish having the least total forestland.

Forestland Ownership Structure

Private non-industry landowners comprise the largest ownership group in the adjacent parishes. Again, this is in keeping with data found in earlier research on land ownership structure throughout the state. Private non-industry landowners hold about 1.46 million acres, forest industry ownership comprises another 1.23 million acres and all public sector holding total 585.9 thousand acres of forest land. The land ownership structure has is important because of the potential impact on availability or timber for harvesting and the forest replanting habits and attitudes of private landowners.

Conventional wisdom says that many small landowners do not replant after harvesting because of the desire to maximize profits from the sale of their timber assets.

In addition, changing attitudes about the use of publicly held resources and the nature of how public sector timber sales are conducted could also effect availability of timber resources in the future.

Also of importance to the availability of future raw material supplies from adjacent parishes is the structure of the age classes or timber stand size classes in these adjacent parishes. The acreage of understocked land has been decreased by about 75% from 1974 through 1991. This development alone is very important as an indicator of future timber supplies. In addition the number of acres replanted had grown 23%, again indicating that there is a significant reforestation effort underway in these parishes. However, current inventories of both poletimber, a very high value product, and sawtimber show moderate to light decrease during the same period, 14.23% and 2.6% respectively.

1991 Growing Stock: Diameter and Species Groups

As with data on the primary study region, in virtually all species the central tendency is skewed left to small diameter classes around the 12 - 14 inch class size of saw timber. This tendency demonstrates the state of virtually all forestlands in the state and in the adjacent counties in Texas and Arkansas as well. The size class distribution may well represent the commercial maturation size for trees planted in the region during the 1940's and 1950's.

The tendency towards smaller diameter trees reflects the continuing harvesting activities of timber through the area. The effect of harvesting activity indicates very high pressure and reduction in volumes in the same size classes where volumes are highest. This concentration of harvesting also demonstrates industry's ability to utilize smaller diameter trees in manufacturing process.

A closer look at softwood species that dominate the forestland acreage shows that harvesting since 1984 has reduced volumes in all diameter classification and the shape of the diameter distribution has remained fairly constant. This distribution curve may indicate a well planned and strategically oriented harvesting methodology by industry both own forest industry controlled lands as well as industry's purchasing activities from private landowners.

While no graphic is presented there are nominal quantities of cypress in the region and the distribution size curve is much the same as for other softwood species. The major difference is that cypress stands are not being over-harvested and may represent a limited opportunity for some niche specific development as 1991 volumes exceed data on 1984 volumes.

Information was gathered on the size and distribution of both soft and hard hardwoods in the adjacent parishes. Several points can be made concerning these data. First the distribution curves are strikingly similar for both classifications. Second, The volume of

hard hardwoods is significantly higher than that of soft hardwoods. Third, at the time these data were reported, soft hardwood volumes had grown to greater volumes than in 1984. Fourth, hard hardwood volumes had decreased from 1984 levels. Finally, referring back to earlier softwood data one can see that the tendency to smaller diameter trees is strikingly similar to softwoods in the region.

Hardwood lumber producers report growing demand for southern hardwood products. In addition, hardwood panel products producers are finding more application for engineered wood and panel products that can use hardwoods. This increased demand for lumber and panel products utilization, as well as an influx of hardwood chip producers into the region, may mean that the future will see greater pressure and increased utilization of hardwoods in the adjacent parishes as well as in the primary study area.

1991 Sawtimber Status

Sawtimber data are very similar to the data for the study region; significant clustering of the distribution in the smaller diameter classes regardless of the species grouping. Further, southern yellow pines are far more abundant than other species.

In addition, there has been significant impacts of harvesting activities on the volumes of the various species groups in the adjacent parishes. Again southern yellow pines are the species where the greatest harvesting is occurring. The shape of the distribution curve is very similar across all species groups indicating a well planned harvesting program in is place.

Further, the volume of softwoods present in the adjacent parishes at the time the data was reported is skewed to the higher grades indicating significant opportunity in high value-added products. Of interest in this particular data set is the rather typical bell shaped curve of the data concerning hard woods with the central tendency clustered around grade three.

1991 Growing Stock and Sawtimber Volumes

Southern yellow pine volume far exceeds volume of other species. Combined totals of red and white oaks rank second with sweetgum the third most abundant single species. Reported in cubic feet is the custom for standing timber. The data indicate that significant volumes of timber resources were available at the time the data were recorded.

Whether southern yellow pine or one of the many high-valued hardwoods found in the adjacent parishes, the growing stock inventories located in the adjacent parishes represent valuable resources from which to produce secondary forest products.

1991 Growth/Removal Data for Adjacent Parishes

Of 1991 growth/removal ratio data collected, only hard hardwood growth ratios on national forest lands and soft hardwood growth/removal ratios on forest industry lands have

occurred faster than removals since the reporting of 1984 data. The fact that national forestlands have increasing volumes of hard hardwood and forest industry softwood inventories represent untapped potential for the study regions efforts to add future value and develop the forest products industry.

Texas Adjacent Counties

Forestland Area

Because logs are transported across state lines for processing and Louisiana companies use lumber originating in adjacent states, it is necessary to understand the status of the timber resource in counties adjacent to the study region. Owners and managers of Louisiana companies reported purchasing materials from a variety of sources both in and out of state. However, the focus of this analysis will be on those counties adjacent to the study region only.

Those counties in Texas analyzed are Bowie, Cass and Marion. These three counties report a total 481 thousand acres of forestland. Marion and Bowie contain the lion's share of the timberland acres totaling about 468 thousand acres.

Southern yellow pine acreage in the three counties total 133 thousand acres, oak/pine and oak/hickory account for another 266 thousand acres and bottomland species make up about 82 thousand acres. Figure 2 indicates that the total forestland acreage reported decreased by nearly 13 thousand acres from 1986 - 1992. The bulk of timber land loss occurred in Cass county. Data detailing the nature of the timberland loss were not available.

1992 Timberland Ownership

Private land ownership in the adjacent Texas counties, totaling 349,360 acres or 62.6%, comprises the largest ownership group. As is the case in the study region and adjacent Louisiana counties, replanting activities of the private non-industry landowners may have major impact on the availability of future timber resources.

The timberland of interest here has seen some changes in size class structure since 1975. Seedling acreage has increased while poletimber and sawtimber acreage have both decreased. Total acres of seedlings increased by nearly 49 thousand acres while the total volume of pole and sawtimber decreased by 74 thousand acres. This may be due to a change in land use or overharvesting.

1992 Growing Stock Volumes

The distribution curve for growing stock volumes is strikingly similar to the data for Louisiana. Both states report bell curves skewed left whose central tendency is clustered around the 12 - 14 inch diameter softwood tree. Hardwoods are clustered around an even

smaller diameter tree of between 10 - 12 inches. Changes in these volumes are very similar to Louisiana in that the major harvesting pressure is focused on that same size classification. Again, the similarity in size class structure and harvesting draw-downs indicates a highly targeted and well planned harvesting strategy. Data indicate that since 1986 volumes of both pine and hardwood timber has decreased in virtually all size classifications. On the other hand volumes of cypress timber, though significantly smaller than that of pine have grown during the same time period. This increase in standing cypress timber may well represent a niche specific opportunity for jobs creation.

In addition to the softwood timber found in the region, there exist lesser quantities of soft and hard hardwood. Both soft and hard hardwood timber volumes of larger diameter timber, diameter sizes 20 inches and larger, have increased since 1986. However, growing stock volumes of bole sizes fewer than 18 inches have decreased since 1986. As in Louisiana this distribution may reflect the nature of the timber processing and the trend of technology towards utilization of smaller diameter trees.

1992 Sawtimber Diameter Class and Species Group

Reflecting previous data on diameter size distribution, for all four major species groups, the central tendency of sawtimber volume clusters around the 12 - 14 inch diameter sizes. At the time the data were reported there existed significant volumes of sawtimber in the Texas adjacent counties. However, across the board, all species groups reflect the effects of harvesting activities in the counties studied.

1992 Sawtimber Volume by Grade and Species

Not surprisingly, southern yellow pine dominates the volume of growing stock found in the region. It is important to note that higher grades dominate the volumes of southern yellow pine. However, lower grade hardwoods dominate the volumes of hardwoods found in the region.

Part of the explanation for the dominance of lower grade hardwood growing stock can be explained by the fact that the hardwoods reported are largely bottomland species usually associated with very wet sites. These locations tend to create lower grade lumber. However, the lower grade timber provides opportunity for utility grade applications. Likewise, 1992 sawtimber volumes in the adjacent counties reflect the structure found for all growing stock. Southern yellow pines dominate the high value group with other groups of select red and white oaks present in addition to sweetgum and cottonwoods.

Of the hardwood sawtimber volumes present the classification of other white oaks dominate in all sizes with sweetgum the second most abundant group. These two species groups are largely in the utility group. Diameter sizes are fairly evenly distributed. However, diameters of less than 20 inches are the most prevalent.

1992 Softwood Sawtimber Volumes

Loblolly pine volumes dominate the inventory of southern yellow pine. Interestingly, the central tendency of this species group is somewhat higher than has been seen in most other groups, around the 16 inch diameter size class. The distribution of shortleaf is fairly even across most diameter size classes up to 20 inches. Slash pine volumes are extremely low as are the volumes of cypress in the region.

The growth removal data for these adjacent counties shows that in all but Cass county where data was missing. At the time the data was reported the positive growth/removal ratios for hardwoods indicated that hardwood sawtimber volumes in the adjacent Texas counties allowed for greater utilization and further expansion in the utilization of these species groups.

Arkansas Adjacent Counties

The most recent data available for this analysis is from 1988. However, because many companies in the study region as well as in prior studies have indicated that significant amounts of raw material is utilized by Louisiana in their operations, the inclusion of this data was deemed appropriate. The adjacent counties included in Arkansas are Columbia, Lafayette, Miller and Union.

1988 Forestland - By County and Type

The four counties under consideration contain approximately 1,361,000 acres of forestland. The distribution of forest types contains over 55% in pine -pine/oak mix with the remainder comprised of only slightly more in upland hardwoods than bottomland species.

Further, each of the four adjacent counties has experienced a net loss of forest land since 1978. Total timberland loss in the four counties at the time the data were reported was significant.

1988 Timberland Ownership Structure

Private non-forest industry land ownership is by far the largest ownership group. Private non-industry interests hold over 1 million acres of the timberland in the adjacent counties. This ownership structure could have profound impact future availability of raw material as issues such as reforestation and access to resources come into play.

All categories of stand size class have increased since 1978. Of particular interest is the fact that the understocked classifications have increased as well. However, this may be due to the lack of reporting data from 1978.

1988 Growing Stock Volumes

The trend towards smaller diameter growing stock volumes in Arkansas timber inventories is similar to what exists in Louisiana and adjacent Texas counties. Regardless of species group the shape of the curve indicates that the trend is toward smaller diameter trees. The change in growing stock is also downward indicating harvesting pressure has been sustained over a period of time. While the data presented here is for a period prior to that of Louisiana data, it is interesting to see that trends in the data is similar to those for Louisiana and Texas. The data remains skewed left towards smaller diameter trees. Pine growing stocks, while skewed towards smaller trees shows that volumes of smaller diameter have decreased since 1978. However, volumes of larger diameter trees had actually increased. In addition to the volume of southern yellow pine in the region there also exists nominal volumes of cypress which except in a few size classifications has remained fairly stable in volume and actually increased in most size classifications. As with cypress in Louisiana and Texas these data indicate that the species could support additional value-added processing

1988 Hardwood Growing Stock

Highly skewed to the left or towards smaller diameter tree, the data presented in Data for soft hardwoods and hard hardwoods also indicate that growing stock volumes in both classifications have increased over the reporting period. These data indicate that the resource base could support significant secondary forest products industry development. The reader is cautioned to consider the age of these data.

1988 Sawtimber Volumes by Diameter Class and Species

Sawtimber volume data remains consistent with that found in Louisiana and Texas for later reporting periods. In essence the central tendency of the data is towards to smaller diameter trees, indicating a shift in over all inventory tree sizes to smaller diameter trees during the ten year period prior to the data reported for Louisiana and Texas. Regardless of whether softwoods or hardwoods are under consideration the class sizes tend to be dominated by smaller trees. There have also been corresponding changes in volumes as harvesting has continued.

1988 Sawtimber Volumes by Grade and Species

As with previously reported data, that the higher grades of softwood timber are dominant in the inventory. Soft hardwood data indicates the cluster of grades is about equally distributed around class 3. Growing Stock volumes in 1988 were dominated by loblolly pine which far exceed all other types. White oak, sweetgum, select red oaks and shortleaf pine are available in the region. Bottom land species are also reported though in nominal quantities.

As with the growing stock inventory, sawtimber volumes by species have the exact mix among commercial grade timber as is shown in the overall growing stock. As seen so often before the smaller diameter timber is most prevalent in this data, although some what larger diameters are reported than has been seen previously. Similarly, softwood sawtimber volumes, while significant, are skewed to the smaller diameter trees for both species reported. Loblolly pine volumes far exceed shortleaf. However, in practice in the market place there is no distinction made between the two groups.

1988 Growth/Removal Ratios

The data for hardwood growth/removal ratios indicates that in the three counties for which data were available, virtually all hardwood sawtimber had potential for further sustainable harvesting pressure. The hardwood growth/removal ratios in all three counties could support additional harvesting at the time the data was gathered. Likewise, even though as shown earlier volumes are down, the G/R ratios continue to exceed the harvesting at the time the data was gathered.

When viewed by land ownership, private landowner timber had the highest growth/removal ratios of all. This is important in that it indicates that future supplies may be stable and hence offer excellent opportunity for further development. Only on public sector holding is the rate of removal of a single timber group in the negative, indicating a drawdown of the growing stock of soft hardwoods.

Resources Assessment Summary

The data indicates a wide variety of raw materials in the region and significant commercial quantities. The distribution of tree sizes is heavily skewed to smaller diameter trees indicating that timber processing industries in the region must implement technologies, which can utilize small diameter trees. Many company representatives participating in this study indicated that this is a trend in the industry towards that end.

Private non-forest industry landowners make up the majority of the land ownership structure in the region. This is a crucial factor because it could have significant impact on the availability of raw materials, how and to whom these raw materials are sold and the amount and distribution of regeneration of timber resources on these lands.

The data presented in the following sections clearly indicates that the study region contains significant quantities of commercial softwood and hardwood timber of such quantity and quality to represent an important economic development opportunity and ample supplies for further development of the secondary forest products industry.

Companies in the region produce a wide variety of products from the resource base and distribute these products around the world. In addition to the utilization of raw materials from within the region these companies also import raw materials from adjacent states and parishes to manufacture products for industrial, commercial and end user markets.

References

LeJuene, Cyril, 1995. Associate State Forester. Personal Communication. Louisiana Department of Agriculture and Forestry.

Quarterly Report of Forest Products, 1985 - 1994. Louisiana Department of Agriculture and Forestry.

**Northwest Louisiana Regional
Forest Products Industry Overview**

N. Paul Chance

Richard P. Vlosky

Overview

Northwest Louisiana has a significant primary and secondary forest products industry base. The majority of the region's secondary forest products companies are located in proximity to urban areas. Conversely, the primary producers are located in rural areas or adjacent to smaller rural communities.

Individual forest product company site visits were conducted as part of the analysis of the current value-added wood products sector. In addition to site visits, numerous telephone interviews were also conducted.

The forest products industry in the study region is a vital industry producing numerous products from ample forest resources available to the industry. These products are shipped to markets around the world and demand for the region's products is growing.

Demand is especially good for grade hardwood lumber used in flooring, cabinetry, furniture and other high value-added applications. In addition, utility grade hardwood materials are used in many applications including transportation oriented products, construction applications and miscellaneous other product categories.

Softwoods originating in the area have almost unlimited applications from pulp and paper, cellulose by-products, construction industry applications; domestic and foreign as well as land based and marine applications. Growing demand from around the world is causing softwood stumpage value to soar. Study region producers are responding by increasing planting as well as investing in more efficient technologies.

The outlook of most manager's in the region is for continued market opportunities, though greater competitive pressures are expected as is increasing scarcity of resources. Related to the availability of resources and increased utilization efficiencies is the issue of recycling of currently unusable production material by products. In particular the cut off and drops created in lumber and panel product utilization. In addition, regional companies are seeking assistance in obtaining information on the utilization of ash created by co-generation processes.

Manager's are concerned about the availability of qualified labor and the lack of training for technicians as well as opportunities to upgrade the skills of existing labor. Of particular concern is the lack of basic skills and work maturity training in entry level labor. At the skilled and semi-skilled level, managers reported an absence of computer operation and logic control system skills. Also, the availability of labor skilled in the maintenance and operation of hydraulic and computer controlled hydraulic systems were identified as critical skills needed in the region by the larger employers.

Objectives

In this section, we examine the structure of the secondary forest products industry in the study region. A brief overview of the Louisiana forest products industry is followed by an in-depth discussion of the industry sector in the region. In addition, specific development opportunities and obstacles to development are discussed. Specific objectives for this segment of the study were to:

1. Identify producers in the region.
2. Determine the capabilities and capacity to support future development of the region's existing primary and secondary forest products companies.
3. Determine the product mix of the region's secondary companies.
4. Determine purchase patterns for forest products produced in the region.
5. Determine current products and markets.
6. Identify manufacturing processes and equipment used.
7. Determine the presence of sawmills, dry kilns, millwork plants, particleboard, hardwood lumber, etc. which could support significant secondary development.
8. Are current and potential future companies able to compete in the markets they do/will serve.

Methodology

One core component of the methodology is development of baseline data on the value-added wood products industry. Elements of an industry analysis are varied and include raw material types and supply status, current and potential products that could be produced, business development plans, technology applications, distribution channels and needs and impediments to growth and development.

A list of secondary forest products companies operating in the region was developed from a number of sources including state agencies, telephone directories, association membership lists and private individuals. The list was limited to only those companies in the 2400 Standard Industry Classification (SIC) Code group (sawmills, planer mills, architectural millwork, plywood and other structural members) and the 2500 SIC group (cabinets, furniture, mobile homes, portable buildings, pallets, outdoor decks and outdoor furniture).

Telephone calls were made to confirm that each company was in operation, to discuss the research project and to request participation. The goal was to determine each company's development intentions and potential to provide development opportunity for the region. An appointment was made to visit each company willing to participate and site visits were scheduled. Telephone interviews were conducted with all companies that were not visited. (See Appendix B for profiles of regional companies)

Major Products Produced

Architectural Millwork

There is significant development of the architectural millwork industry segment in the region with a number of companies distributing regionally and nationally. In addition, at least one company reports strong international demand for its products. Architectural millwork products are used in residential and commercial construction, furniture, cabinets and picture frames.

Cabinets

Most cabinetry produced in the region is used locally by the residential and commercial construction industry. Small shops, generally operating as a subcontractor for a larger construction firm make these products. Products in this category include cabinets for kitchens, bathrooms and non-residential markets.

Furniture

Most of the furniture produced in the region is manufactured by small companies and is either one-of-a-kind custom furniture or small batch productions of outdoor furniture.

Hardwood Lumber

Red oak and white oak lumber represent the greatest volume of hardwood lumber products produced by companies in the region. Other hardwoods include cottonwood, poplar, ash, elm and maple. All species are available kiln-dried as well as green. Kiln drying is required for many applications such as furniture and cabinet production as well as typically being a requirement for export customers. Based on conversations with company managers, southern hardwoods are readily accepted in the market and are in high demand across a broad spectrum of applications around the world (Foreman 1996; Cornelius 1996).

Pine Lumber, Plywood, Medium Density Fiberboard and Oriented Strandboard

Demand for Southern yellow pine is high around the world in construction applications. Virtually all Southern yellow pine lumber producers reported that the majority of their products are used by the construction industry. In addition to the domestic U.S. market, Spain, Italy and the Caribbean are major export markets for Southern yellow pine produced in the region.

Plywood, medium density fiberboard (MDF) and oriented strandboard (OSB) produced in the region are also shipped to U.S. and export markets. Much of the plywood and OSB produced in the region is marketed through home centers while MDF is used in many applications including fine furniture, cabinets and molding.

Pallets

A number of companies in the region produce pallets for the transportation and paper industries. These companies use low grade hardwoods that seem to be in ample supply. Further study of this sector and related sectors may provide opportunities for regional companies.

Panel Products

Plywood, Oriented Strand Board (OSB) and Medium Density Fiberboard (MDF) are panel products available to regional producers. These raw materials for the secondary industry are sold around the world for use in a variety of construction industry applications.

Site Visits

Site visits were prearranged by telephone contact with company owner-managers. Follow-up phone calls were made to confirm the date and time of each meeting.

These companies produce a variety products including millwork, cabinetry, kiln dried hardwood lumber, mops, laminated beams and structural members. The companies have generally all been in business for a number of years and are well established in their respective markets. Table 1 provides a listing of those companies visited during the site visit phase of this program:

Table 1. Study Region Forest Products Companies Visited

Table 1 Study Region Forest Products Companies Visited

Company	Contact	Address	City
Ahern Portable Buildings	David Ahern-Brame	P O Box 129, 2210 U S Hwy 71/84	Campti
Allen Millwork, Inc.	Bud Wheless	St. Vincent St.	Shreveport
Almond Bros. Lumber Co.	Ardis Almond		
Ark-La-Tex Pallets	Jeannie Sheffield	4191 Bellevue Rd.	Haughton
ARK-LA-TEX Pallets	Jeannie Sheffield	4191 Bellevue Rd	Haughton
Arnold Forest Products	Don Arnold	10818 Providence Rd	Shreveport
B&S Hardwoods, Inc.	Mike Basham	P. O. Box 724	Gibsland
Bolinger Millworks	Mark Logan	2570 E. Tx. St./403 Hamilton St.(shop)	Bossier City
Broadway Chip & Pallet Corp.	Debbie Broadway		Ringgold
Cason Pole & Piling	Hugh Hardy	Rt 3 Box 92 B, Red Oak Rd	Coushatta
Cooper Chair	James Cooper	217 Pine St; Industrial St.	Minden;Dixie Inn
Custom Cutters	Mike Womack	133 Ct Wilson Rd	Sykes
D J Mills-Dura-Oak Systems	Jeff Mills	863 Texas St	Shreveport
Davis Lumber	Larry Davis	P. O. Box 455, 4299 Hwy 120E	Provencal
Don's Manufacturing	Don Chapman	3246 StageCoach Rd	Keithville
Hanna Manufacturing	Rick Hanna	P O Box 1335, Hwy 156	Winnfield
Hood Industries	Nathan Scarborough	P O Box 391, 306 Wilkerson St	Coushatta
Hust Woodwork	John Hust	13244 Kiethville-Keachie Rd	Keithville
La. Wood Moulding	Bill Comer/Don Trapp	Industrial Pk. North, Hwy 2w, Box 629	Homer
LayFlat Products, Inc	Larry Beadles	901 Tatum St..	Shreveport
Logansport Lumber, Co.	J K Jackson	P O Box 657, 104 Main St	Logansport
Lumber South, Inc.	JR Mitchell	P O Box 304	Robeline
Martco-Chopin	Jerry Buckner	1695 Hwy 490	Chopin
Mims Lumber Co.	Jack Mims	165 Radio Station Rd	Mansfield
Oak & New Treasures	Sharon McLemore	Box 11997, Hwy 80	Dixie In
Pelican Wood, Inc.	Don Brick	900 Pierremont Rd. Suite 107	Shreveport
Quality Wood	John Paul	Rt 2 Box 218, Plant Parish Rd 706	Coushatta
Rushing Custom Sawworks	Mac Rushing	404 Box Factory; R 2 Box 290	Homer
Sabine Wood Products	Ronny Broadway	5340 Tx Rd, 1717 Recknor Rd	Mary
Shreveport Pallet Co.	Clint Fontenot	Grimmett Dr.	Shreveport
Southern Components	Bob Ward	7360 Julie-Francis St.	Shreveport.
Tharpe Cabinets (Out of Bus.)	Mark Tharpe	310 Temple Rd.	Minden
The Woodchuck	Mitch and Patti Mitton	2782 Cook Rd.	Ruston
Trus-Joist Macmillan-Ltd	Mike Wolf	234 Industrial Ave	Natchitoches

In addition to those companies visited a number of other companies were interviewed by telephone when site visits were unable to be completed.

The region's sawmills are included in this research to better ascertain the raw material availability, its distribution and type, location and end products made by those companies utilizing raw materials originating in the region. Further, because there are a significant number of lumber producing mills in the region, excluding them would be to overlook a significant element of the development potential of the area.

As is characteristic of the hardwood sawmill industry, the hardwood producers visited generally small family owned mills that produce for a fairly localized market and rely heavily on familial connections to maintain their competitive position in the market.

Sawmills located in a parish adjacent to the study and are included in this research to better ascertain the raw material availability, its distribution and the type, location and end products made by those companies utilizing raw materials originating in the region. The export of hardwood from the region, especially grade logs, appears to a major issue for future development. Because of industry structural issues, the likelihood that such export will continue is high. Thus it is important to understand the destination and use of this material.

A recently completed hardwood chipping facility located on the Red River near Natchitoches may also provide competition for mills in the region that produce hardwood lumber. While the chipping facility ostensibly uses only lower quality sawlog and pulp hardwood, a short visit to observe the operation revealed significant amounts of large diameter hardwood timber on the log deck. During times of short supply this facility may provide significant competition to the regions hardwood lumber producers and become important competitors for the hardwood resources in the region.

The research team visited a possible location for a wood products training facility located in the England Development Park in Alexandria. Though outside the study region the location of this facility in such close proximity to the southern region of the study area is of interest as a possible training site because of the many attractive wood products training capabilities available. Facilities include a building equipped with standard small company technology that could be made useable with a minimum investment. Further, there are many other amenities such as dormitories, four year college courses and facilities, complete distance learning facilities including compressed video and satellite facilities, conference facilities to name but a few.

Technologies Employed

The production technology employed by most the study region's companies is largely low tech. In general, only the larger companies participating reported the use of computer controlled laser technology to increase yield in their production processes. Only a small number of companies indicated the use of sophisticated molding machines in their operations. Wide belt sanders, table saws, panel saws, heavy material handling equipment and fairly standard material processing tooling was prevalent at the sites visited.

The state of the technology was somewhat surprising given the fact that several of these companies are able to successfully compete internationally. Closer study of the markets served by these companies may offer insight as to how these companies are able to compete successfully in the markets they serve.

However, on the other end of the technology spectrum engineered wood products firms in the study region utilize state of the art technology from recognized equipment producers. The use of efficient production processes is crucial in order to be competitive in the markets in which they operate. The investments in the plants represents hundreds of millions of dollars.

The Martco plant equipment includes modern saw mill head rigs, one veneer peeling line, two drying lines, two lay-up lines and 2 press lines. In addition, the plant also includes a fully equipped log deck and chipping facility which provides heat for the hot oil heated log cooking vats used to soften the log prior to peeling. This facility is the most completely vertically integrated the three sites visited on this trip and may represent the most recent facility investment made by any company in the study region.

The Trus Joist - MacMillan plant also utilizes state of the art production lines and processes. However, this facility purchases much of its chips and veneers from other locations in the region. The bulk of the equipment utilized in this plant is oriented to the cutting, handling and glue up of structural members from other panel products. In addition, the plant produces its own veneers and chips from southern yellow pine. As with the Martco operation, the availability of raw material and continued growth in demand for raw materials is expected to become an increasingly important issue for the Trust-Joist Macmillan operation.

Product Distribution

Distribution channels varied from very short channeled local markets to complex international distribution systems. Various distribution channels include producer to final user, producer to local contractor to end user, producer to jobber, producer to wholesaler to retail national distribution, producer to regional retail outlet and producer to end users located throughout the United States.

The larger companies' products are distributed around the world. Principal regions are Europe, South America and the Pacific Rim. These companies are fully integrated companies complete with sophisticated marketing and distribution systems. While the majority of the products are utilized by the construction industry, there is very little distribution through home building centers to retail markets. Most of the products produced by the companies are used in industrial markets and hence are distributed through large wholesales and brokers. The commodity nature of these products requires the sale and movement of large quantities of products with a minimum of distribution and marketing costs. Many of the larger firms indicated that stable long-term relationships were extremely important to their distribution systems.

Important to the discussion of product distribution is the fact that the Martco plant near Chopin represents the first plywood plant built in the United States in nearly two decades. The products produced here represent an attempt by this company to compete in specialty markets that use 1/4" - 1 1/8" thick sanded side plywood and flooring underlayments.

On the opposite end of the spectrum is the small hardwood sorting and resale operation located in Robeline. At present the operation is little more than a couple of acres of raw land on which purchases of hardwood from area mills is sorted, air dried and resold to other value adding companies that do not require kiln dried raw materials. The company's products are distributed to small users of hardwood lumber in the local market. The owner hopes to add kilns that will enable him to distribute to a wider range of client and extend the market reach of his company.

Materials Used

The principal hardwood materials utilized include grades of southern oak, northern and Appalachian oaks, soft maples, cherry, mahogany from number 2 common to FAS and Selects and Better. Softwoods include southern yellow pine logs and timbers, spruce and fir and treated SYP 2x6 and 2x4 lumber. Panel products used by companies using panel products include domestic products, including Louisiana produced pine products and imported products from a number of overseas sources.

While much of the southern hardwood is cut and milled from in-state sources a significant amount of hardwood lumber originates from outside Louisiana. Virtually none of the material used in the production by the only mobile home producer originates in Louisiana. Further, other producers utilizing SYP indicated they purchase their material in a commodity market and as such shop price from both in-state and out of state vendors.

Obstacles to Development

Numerous issues were identified by the owner/managers with whom we spoke concerning future development of their companies as well as a concern the industry in general in the northwest Louisiana area. The degree of dependence on and the effect of international political and economic activities had a decidedly important impact on many of the companies visited.

Other issues include tariffs on the import of raw materials, the lack of exporting technical assistance or knowledge of sources for such assistance, governmental regulation restricting access to public forestlands as well as environmental and administrative regulation controlling harvesting quotas. In addition, local sales taxes and tax codes, the complexity of complying with state and federal regulatory requirements, lack of local access to sea going containers, and the ubiquitous poor labor quality issues were the most often reported constraints. Another issue that was voiced by virtually every company visited as well as others attending the informational meetings is the need to reduce the amount of waste being lost to landfills. The company executives visited recognize this factor as a major loss of potential revenue and an issue that is becoming one of environmental concern as well.

Assistance Needs

While labor force training issues are a concern for all company executives visited, training in management and marketing issues were pointed out as important for future development by three companies. Several companies have aggressively pursued the development of such a training program for their training needs. However, most companies have not developed formal training programs. This is due in large part to the disruptive nature of formal training in an operating situation. Most of the people interviewed indicated that establishing such programs internally is simply too time consuming, expensive and locating the available resources for such training has been very difficult in addition to the aforementioned problem.

Mail Survey Study and Results

In addition to information gathered through site visits and telephone interviews, a fax survey of wood products companies (both primary and secondary) in the region was conducted. Twenty-nine companies responded out of sixty-five faxes transmitted (45 percent response rate).

Figure 1 shows the distribution of respondent companies by annual sales in 1996. Just over 25 percent of respondents reports sales less than \$500 thousand while 38.5 percent reported sales over \$10 million. On average, for the industry as a whole, secondary companies in Louisiana have sales of \$1.2 million while primary company sales average \$24.6 million.

Figure 1.

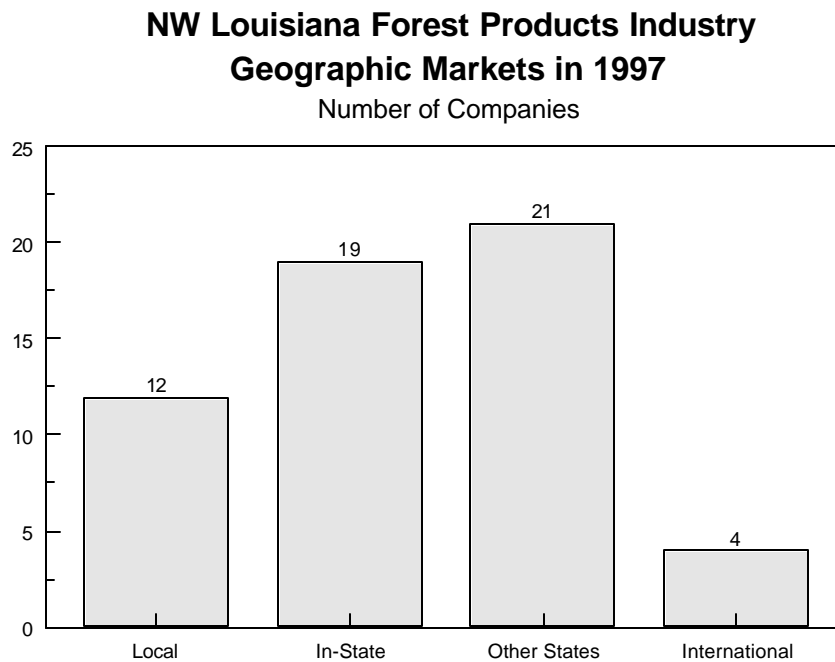
NW Louisiana Forest Products Industry Company Size by Sales Category (n=29 companies)

\$500K-\$999K 7.7%

\$250K-\$499K 11.5%

Figure 2 indicates the market reach for respondent companies. Markets are varied with most companies selling product into national markets. Only 4 companies sell into international markets (14 percent of respondents).

Figure 2.



Respondent companies indicated current employment of almost 5,000 employees (Figure 3). The majority of these employees are production workers (89 percent), while the balance are in administrative and management positions.

Figure 3.



Figure 4 shows planned employment additions by respondent companies in 1997 and over the 1998-2000 time frame. Based on current employment, a 6.9 percent increase is projected (341 new employees). Figure 5 shows the number of companies that are planning employment additions over these time periods.

Figure 4.

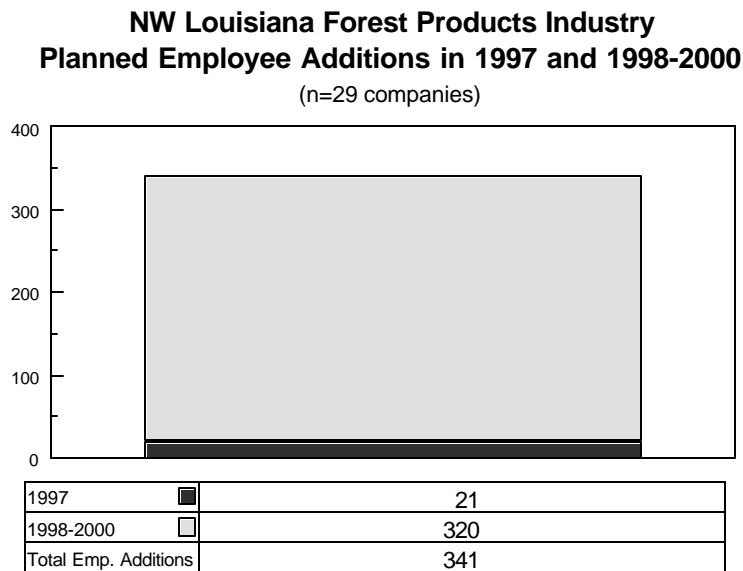
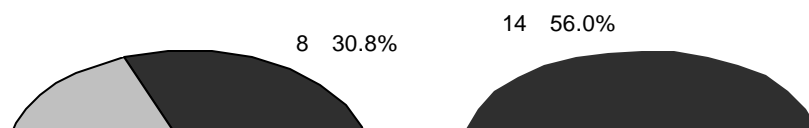


Figure 5.

**NW Louisiana Forest Products Industry
Companies Planning Employment Expansion**



Using 5-point scaled questions were posed indicating whether an issue is a problem for the company to compete (1=not a problem to 5=is a significant problem). As seen in Figure 6, the top two issues are workers compensation and unemployment insurance. Additional issues above 3.0, the midpoint, are a lack of a skilled labor pool to hire from, and OSHA and other environmental regulations. Statistical analysis (one-way analysis of variance) indicates that there are no differences in responses between companies regardless of size or industry sector.

Figure 6.

NW Louisiana Forest Products Industry Factors That Hinder Ability to Compete

Industry Summary

The product mix of the companies located in the region is quite varied, generally of excellent quality and readily accepted in markets outside Louisiana. Major products include kiln-dried and green lumber for architectural millwork, furniture, cabinets, flooring products and pallets. Several companies distribute nationally and internationally. Europe and Japan represent the major international markets while domestic markets are located across every region of the continental United States.

The majority of the secondary forest products companies are small and use relatively unsophisticated and standardized manufacturing processes and equipment. However, these companies are able to compete in the markets they serve. Those companies that have grown and prospered have done so by exploiting specialty niches and cutting costs.

In the view of fax survey respondents, the most important factors preventing industry development in Louisiana are the cost of workman's compensation insurance and corporate taxes. Reversing the current trend away from manufacturing in the state will require a total effort of local and state officials aimed at leveling the playing field with other states in terms of the impact of the manufacturing disincentives. In addition, legislation aimed at bringing worker's compensation premiums in line with loss payment decreases would also be beneficial.

These facts of business life in Louisiana must be recognized and accounted for in the development of recruitment packages and programs aimed at attracting secondary forest products companies into the region. While many larger companies may find Louisiana's current mix of location incentives beneficial, many owner/managers of small and mid-sized firms indicated they are not offered the same incentives. Often they simply do not qualify for the programs that would make it economically feasible for them to relocate into the state or to expand on existing operations.

Regardless of the obstacles mentioned, development opportunity for the region exists through value-added forest products manufacturing. Recruitment of firms in value-added forest products industry sectors should focus on regions of the U.S. where regulations have created unfriendly operating environments and where companies are currently utilizing Southern woods. Southern California and areas of the northeastern U.S. may represent likely targets.

Existing secondary forest products companies in the region, particularly in areas where a number of related companies are located represent significant development potential.

The presence of sawmills, dry kilns, millwork plants and OSB production all represent forest products industry infrastructure that could support significant development in the region.

References

Cornelius, Ronny, 1996. Telephone Interview. Oaks Unlimited, Waynesville, NC. June.

Kelleher, Elizabeth, 1996. The Kiplinger Washington Editors. June.

Louisiana in Profile: Macon Ridge Regional Profile, 1996. Entergy Louisiana Economic Development Group. Baton Rouge, LA.

Louisiana Population Data Center, 1996. Internet Home Page, LSU Department of Social Work, Baton Rouge, LA. June.

Morgan, Barita, 1996. Office of the Louisiana Commissioner of Insurance. Telephone Interview. July

PAR ANALYSIS - Corporate Tax Burdens in the Southern States: A Comparison. 1994. Public Affairs Research Council of LA, Inc. Baton Rouge, LA. December.

Roach, David. 1996. Office of Policy and Planning, Louisiana Department of Economic Development, Baton Rouge, LA. August.

State of Mississippi Tax Code, Sec. 1340, 1996. Louisiana Department of Economic Development. Baton Rouge. July.

**The Solid Wood Products Market Environment
and
Market Opportunities for Study Region Manufacturers**

Richard P. Vlosky

N. Paul Chance

The Solid Wood Products Market Environment

Introduction

A major factor in determining the probability of industry success is the market structure for current or potential products. This section contains a review of secondary literature and studies on factors that influence primary and secondary forest products supply and demand in the region.

General U.S. Market Conditions Influencing Value-Added Wood Product Demand¹

In order to examine the attractiveness of participating in forest products markets and industries, it is important to understand the overall drivers of product supply and demand. Following is a discussion of the macro-demand drivers for wood products demand and the outlook for major raw material markets (lumber and panels) for the secondary wood products industry.

U.S. Housing Starts

According to a Resources Information Systems, Inc. (RISI) (1996) assessment of U.S. housing starts, fundamental demand for housing indicates that with the baby-bust generation still moving into the primary home-buying age class, the underlying demand for conventional housing is estimated to be in the range of 1.25-1.35 million units per year in the 1990s. Housing starts will average 1.32 million units per year over the next 5 years, up from 1.26 million units per year in the first half of the decade.

Repair and Remodel

Growth in R&R expenditures has been disappointing in the early 1990s, held down by a drop in spending for maintenance and repair in non-owner occupied housing and weakness in total R&R spending in the California market. After expanding at just 1.1 percent per year in 1993-1995, the growth in total R&R spending improved to 2.5 percent per year in 1996-1997. However, the benefits to the wood products markets from improved growth in spending will be moderated by the fact that most of this strength will originate from expenditures in maintenance and repair, and not in the more wood intensive alterations and additions sector. R&R spending is expected to succumb to higher interest rates in 1998-1999, followed by a cyclical improvement in 2000 (RISI 1996).

¹ From: Resource Information Systems, Inc. 1996. Wood Products Review.

Value-Added Solid Wood Products Raw Materials

In order to gauge demand potential for Louisiana products, an overview of the national economic factors affecting the industry is necessary. In particular, supply and demand of raw materials (lumber, panels and composite products) will affect pricing and profitability for region producers. Demand for wood products is expected to slump in 1998-1999 as housing construction retreats and the U.S. and Canadian economies slow.

Softwood Lumber

As has been the case throughout the 1990s, the most dramatic changes in the North American softwood lumber industry and the major source of risk and uncertainty to any forecast arise from the supply side of the market. The outlook for total demand for North American softwood lumber will see a mild cyclical setback in 1998-1999. With continued, albeit slower, growth in capacity in the U.S. and Canada, the demand/capacity ratio for the industry is expected to drop to a cyclical low of 84 percent in 1998-1999. The next cyclical recovery, forecast for 2000, should once again test the supply limits of the U.S. and Canadian softwood lumber industry.

Hardwood Lumber²

Hardwood lumber is used for both appearance and industrial applications. Appearance applications include furniture, millwork, cabinets, paneling, flooring and other products where natural beauty is highlighted. Industrial applications include pallets, railroad ties and other uses where strength and durability are important.

Estimates indicate that demand for appearance applications moves with the overall economy having increased by 23 percent between 1982 and 1992. If exports are included as an appearance application, then hardwood lumber demand in these applications increased by 34 percent during the last decade.

During the 1980's, hardwood lumber use in industrial applications continued to increase because of the increased use of hardwood pallets. Between 1982 and 1992, hardwood lumber use for-industrial applications increased by 46 percent. Most of this growth was the result of a 62 percent increase in hardwood lumber use by the pallet and container industry. However, hardwood lumber use in structural member production increased only slightly over the last decade while use of treated hardwood materials declined slightly.

A total of seven appearance and industrial applications show growth for the period 1977-1991. Six of these categories are major customer groups for companies operating in the study region. Of particular interest are the flooring, pallet, export and miscellaneous products sections. The miscellaneous products group includes many products that are

² From: Luppold, William G. 1993. Decade of Change in the Hardwood Industry. Proceedings of the Twenty-First Annual Hardwood Symposium of the Hardwood Research Council. Coping with Economic and Social Changes. May 24-26. Cashiers, NC. pp. 11-24.

produced from small parts and could easily be made from existing materials. Further, picture and mirror frames can easily be produced by millwork firms operating in the region.

The international market for domestically produced hardwood products has consistently grown over the last two decades. Factors such as the U.S. trade deficit and the declining dollar, reduced supplies of tropical material because of political, economic, and environmental issues, and the ability of U.S. producers to provide international customers a consistent product all point to increased growth of the export market. Other factors, however, may hinder growth.

Medium Density Fiberboard³

U.S. MDF demand grew strongly between 1985-1992, led by a boom in exports and growth in U.S. furniture usage. However, exports dropped in the years after 1992, as domestic markets soared to record levels, pushing up domestic prices and making overseas sales less attractive. Much of the increase in total MDF demand in the late 1980s was accounted for by just two sectors: exports and the industrial (furniture) market.

Rapid growth in furniture and other industrial markets, plus the decline in export volumes and share, pushed the industrial share from its 64 percent plateau of the early 1990s to 67 percent in 1994 and 69 percent in 1995. Over the next few years, the industrial market share is projected to slide lower, as consumption in millwork, moulding, and flooring grows faster than in traditional furniture and cabinet end-uses.

Construction markets will experience an increase in their share from 23 percent in 1995 to 30 percent by the end of the decade, providing that MDF is accepted in millwork, moulding and flooring applications, as well as in kitchen cabinets.

While exports soared through 1992, the core business for U.S. MDF producers remained the domestic industrial markets, especially household furniture. In 1995 approximately 69 percent of the total MDF market (exclusive of kitchen cabinets) was classified by RISI as industrial (822 MMSF). In 1995 80 percent of this volume was derived from the household furniture sector. (In other words, approximately 55 percent of total MDF demand in 1995 was accounted for by household furniture manufacturers.)

Office furniture and fixtures accounted for another 12 percent of the industrial market in 1995, unchanged from 1991-1994 but down from the late 1980s, when MDF usage in office furniture declined. Nevertheless, in 1995, the 95 MMSF consumed in this end-use market, while down from 1994, was still 23 percent ahead of the 1991 pace. The remaining 8 percent of the industrial volume (69 MMSF in 1995) was consumed in other products made for consumption, including TV/stereo cabinets, toys, etc. This share of the industrial market has declined since the mid-1980s.

³ From: Resource Information Systems, Inc. 1996. Wood Products Review. Bedford, MA

Particleboard

Cabinet consumption of particleboard as cabinet markets themselves will be flat and particleboard penetration of this end-use will be slower than in the early 1990s. As with the furniture market, it will not be until the end of the forecast (2000) that a significant increase in consumption is expected.

Major Value-Added Wood Product Sector Market Profiles

The Standard Industrial Classification System

Most government data and much of the privately collected data on U.S. industries and markets is organized according to the Standard Industrial Classification (SIC) system. The SIC system divides economic activity into eleven divisions, each of which contains major industry groups classified by a two-digit number. For example, one of the eleven divisions represents manufacturing industries with two-digit codes ranging from 20 to 39. The two manufacturing groups SIC24 and SIC25, representing solid wood products, are presented in Table 1. The other major wood product group, SIC26: Paper and Allied Products, is not considered in this report.

⁴ From: Resource Information Systems, Inc. 1996. Wood Products Review. Bedford, MA

Table 1. SIC Industries-Forest Products

SIC Industry Group 24: Lumber and Wood Products

- 2411 Logging
- 2421 Sawmills and planing mills, general
- 2426 Hardwood dimension and flooring mills
- 2429 Special product sawmills, n.e.c.
- 2431 Millwork
- 2434 Wood kitchen cabinets
- 2435 Hardwood veneer and plywood
- 2436 Softwood veneer and plywood
- 2439 Structural wood members, n.e.c.
- 2441 Nailed and lock corner wood boxes and shooks
- 2448 Wood pallets and skids
- 2449 Wood containers, n.e.c.
- 2451 Mobile homes
- 2452 Prefabricated wood buildings and components
- 2491 Wood preserving
- 2493 Reconstituted wood products
- 2499 Wood products, n.e.c.

Industry Group 25: Furniture and Fixtures

- 2511 Wood household furniture, except upholstered
- 2512 Wood household furniture, upholstered
- 2514 Metal household furniture
- 2515 Mattresses, Foundations and Convertible Beds
- 2517 Wood television, radio, phonograph and sewing machine cabinets
- 2519 Wood furniture, n.e.c.
- 2521 Wood office furniture
- 2522 Office furniture, except wood
- 2531 Public building and related furniture
- 2541 Wood office and store fixtures, partitions, shelving and lockers
- 2542 Office and store fixtures, partitions, shelving and lockers, except wood
- 2591 Drapery hardware and window blinds and shades
- 2599 Furniture and fixtures. n.e.c.

Within each two-digit group, industry subgroups are further defined by three- and four-digit codes. SIC coding extends to seven digits for specific products. For example, SIC 243 refers to “millwork, plywood and structural members, not elsewhere classified,” SIC 2431 refers specifically to millwork and SIC 24311 refers to wood window units. Each business establishment at a single physical location is assigned a four-digit code according to the principal product produced, sold or exchanged in that facility.

The four-digit industries are often regrouped by analysts according to the nature of raw material used (cants or logs versus lumber or plywood) or the extent of value-added activity

reflected in the final product (lumber or plywood versus a window unit or a piece of furniture). The term “primary industry” refers to processing centers that convert raw materials such as logs or cants into lumber, plywood, or similar products. In contrast, the term “secondary” or “remanufacturing” industry refers to establishments that convert lumber, plywood or other output from primary industries into products such as moldings, windows, furniture, etc.

The 18 industries in Table 1 that are labeled “secondary” in boldface are commonly considered to comprise the secondary industry. The secondary industries comprise a diverse group. Some produce industrial products such as component parts, that are used by other secondary industries, while others produce finished consumer goods such as furniture.

Census of Manufactures

Economic censuses, known as the Census of Manufactures, are conducted by the U.S. Department of Commerce, Bureau of the Census. They are the major source of facts about the structure and functioning of the U.S. economy. They provide valuable data on measures of the well being of the economy, to aid government in formulating policies and for studying trends in industries and markets. Since 1967, economic censuses have been conducted as an integrated program every five years. Prior to 1967, individual industry censuses were taken separately at varying intervals. In each of the four years between the Census of Manufactures, an Annual Survey of Manufactures is conducted, gathering the same information as the Census but from a sample of establishments.

Using Census data for analyzing forest product industries has certain limitations. The Census places an establishment into a four-digit SIC class according to its principal product. As a consequence, Census data may under-represent the full scope of activity in an industry. Table 2 shows secondary forest products industry value of shipments by SIC code in 1990 and Table 3 shows top producing states for various sectors in the same year.

Table 2. Secondary Forest Products Industry Value of Shipments, 1990.

SIC Code	Description	Value of Industry Shipments	Percentage
		(million \$)	% of Total Shipments
2426	Hardwood dimension and flooring	1,800.5	3.1%
2431	Millwork	9,524.7	16.2%
2434	Wood kitchen cabinets	4,610.0	7.8%
2439	Structural wood members, n.e.c.	2,028.4	3.4%
2441	Nailed wood boxes and shook	431.3	0.7%
2448	Wood pallets and skids	1,948.6	3.3%
2449	Wood containers, n.e.c.	470.2	0.8%
2451	Mobile homes	4,202.5	7.1%
2452	Prefabricated wood buildings	2,268.5	3.8%
2491	Wood preserving	2,642.7	4.5%
2499	Wood products, n.e.c.	3,871.8	6.6%
2511	Wood household furniture	8,302.9	14.1%
2512	Upholstered household furniture	5,815.3	9.9%
2417	Wood television and radio cabinets	246.9	0.4%
2521	Wood office furniture	1,998.8	3.4%
2531	Public building and related furniture	3,112.4	5.3%
2541	Wood partitions and fixtures	3,147.2	5.3%
2599	Furniture and fixtures, n.e.c.	2,547.3	4.3%
Total		58,970.0	100.0%

Source: Department of Commerce, Annual Survey of Manufactures.

Table 3. U. S. Secondary Wood Products Shipments Leading Producer States

SIC	Product	Value	Top Producing States			
2426	Hardwood Dimension & Flooring	\$1,711.0M	TN	MS	VA	AR
HOUSE STRUCTURAL PARTS						
2431	Millwork	9,152.9M	CA	MN	TX	WI
2434	Wood Kitchen Cabinets	4,405.3M	CA	PA	TX	IN
2435	Hardwood Veneer, Plywood	2,044.0M	NC	WI	GA	IN
2439	Structural Wood Members	1,925.5M	OR	CA	FL	OH
WOOD HOUSEHOLD FURNITURE						
2511	Wood Household Furniture	7,929.3M	NC	VA	CA	TN
2512	Upholstered Household Furniture	5,247.7M	NC	MS	CA	TN
2517	Wood T.V. and Radio Cabinets	351.6M	CA	NY	AR	
WOOD OFFICE FURNITURE						
2521	Wood Office Furniture	2,086.7M	CA	NC	IN	MI
2541	Wood Partitions & Fixtures	2,803.6M	CA	NY	IL	MI
2599	Furniture & Fixtures, NEC	1,923.3M	CA	NY	MI	OH

Millwork⁵

According to U.S. Department of Commerce census data:

- The millwork industry is dominated by small establishments; 69 percent have fewer than 20 employees and only 6 percent had more than 100 employees.
- Between 1987 and 1991, total employment varied between 85,000 and 91,000; about 72 percent were production workers.
- Value of shipments varied between \$9.0 and \$9.7 billion, making millwork the largest of what are commonly called the secondary solid wood product industries. Of the 95 percent of these shipments which were millwork products: doors (32 percent), windows (27 percent), moldings (12 percent) and other (29 percent)

⁵ From: Briggs, David G., Lee Bialozynski and Steven R. Shook. 1994. The U.S. Millwork Industry: Historical Trends Based on U.S. Department of Commerce Statistics. CINTRAFOR Working Paper 48. University of Washington. Seattle, WA. May.

- Of the expenditures for materials, 43 percent was for wood materials broken down as follows:

⇒ lumber	87%
⇒ softwood	72%
⇒ hardwood	15%
⇒ hardwood veneer	6%
⇒ plywood	4%
⇒ softwood	1%
⇒ hardwood	3%
⇒ particleboard	2%
⇒ medium density fiberboard	1 %

- In 1990, millwork producers were estimated to have consumed 24 million board feet (BF) of logs; 2.6 and 0.9 billion BF of softwood and hardwood lumber, respectively; 173 million square feet of veneer; 96 million square feet of plywood; and 133, 68, 45, and 19 million square feet, respectively, of particleboard, medium density fiberboard, hardboard and oriented strandboard (Briggs and Bialozynski 1995).
- Value-added by manufacturing varied between \$3.7 and \$3.9 billion. The principal markets for millwork products are:

⇒ new private construction	49%
⇒ repair and remodel	47%
⇒ public construction	3%
⇒ prefabricated housing	2%
- According to U.S. Department of Commerce trade statistics for 1989-1992: exports as a percent of value of shipments have grown from 1.1 percent in 1989 to 2.4 percent in 1991.
- In nominal dollars, comparison of 1989 and 1992 trade data shows that U.S. millwork exports grew from \$ 102 to \$272 million while imports declined from \$310 to \$306 million. The trade deficit in these products declined from \$208 to \$34 million.

- The composition of exports is:

<u>Product</u>	<u>% of 4-year total</u>	<u>Trend</u>
doors and components	44.6	increasing
softwood moldings	28.3	increasing
windows and frames	18.1	decreasing
hardwood moldings	7.0	decreasing
blinds, shutters & other	2.1	decreasing

- Export trade for all products is dominated by Canada and Mexico. Other important markets for specific products are the Pacific Rim (mainly Japan), Europe and the Caribbean.

Cabinets⁶

The cabinet industry is generally a mature industry characterized by standardized technology and fierce price competition. Products produced by this industry are non-standardized heterogeneous shopping goods which include a high degree of personal service and attention from the consumers point of view. In addition, when the consumer is unable to find distinguishing characteristics between substitute products, pricing becomes a major choice issue.

The cabinet industry is divided into two major industry segments; 1) store fixtures and 2) residential kitchen and bath cabinets. Store fixtures include display cabinets and wall units. As in the residential market, store fixtures can be further subdivided in to new construction and repair and remodeling. This section focuses on the residential cabinet industry.

Because of these product and consumer characteristics, cabinet companies usually spend a relative large amount of time and effort in personal selling. These companies also rely heavily on word of mouth promotion as the major component of their marketing program.

One study of cabinet manufacturers in Louisiana indicates that, in general, cabinetry companies are small with an average of 11 employees (Chance et al. 1996). This study reported that principal raw materials used in cabinet production were 1) Hardwoods - oak, maple and poplar as well as mahogany, old cypress and ash and 2) Softwoods - cypress and pine. Panel product usage included oak, maple and birch with medium density fiberboard, high density fiberboard, pine cypress, meranti and others also mentioned.

Another study of the cabinet industry in the U.S. South indicates that red oak was the dominant species used by study respondents in 1994 with 28.6 percent (45.6 MMBF) of total respondent raw material volume. The most used species (by volume) by study respondents after red oak in order were maple (21.3 percent), pine (15.2 percent), poplar (11.3 percent), ash (11.3 percent) and cherry (7.2 percent) (Vlosky 1995).

In that study, plywood had the highest average percent by value (33.8 percent) and also had the highest number of respondents that used it as an input. Hardwood dimension and veneer were nearly tied for last.

Most cabinet companies sell their products in state and within a radius of 100 miles. The products are generally sold to married women with children. The typical family owns or is

⁶ From: Acikgoz, Tayyibe, Thad Becton and Paul Chance. 1996. A Market Analysis of Selected Louisiana Cabinet Manufacturers. Louisiana Forest Products Laboratory Report. Louisiana State University. Baton Rouge, LA. Spring.

buying a home valued in the range of \$150,000. The family income is generally in excess of \$50,000 per year but less than \$250,000.

Two market segments are projected to positively influence the cabinet industry, new construction and the repair and remodeling industry. The R&R industry has the potential to become much more important as consumers replace the facing of existing cabinets instead of the entire cabinet unit.

However, the largest increase was expected in cabinet jobs priced from \$10,000 to \$14,999. This is an estimated 26.4 percent increase to 193,000 jobs. Smaller \$5,000 cabinet jobs were expected to increase 8.4 percent. Cabinet jobs of \$15,000 or larger were expected to increase approximately 3.5 percent. These estimated increases are driven by positive economic projection and expectation such as decreased unemployment, low inflation rates, stable interest rates, increased new housing starts and growing sales of existing homes.

Residential Cabinet Industry Structure

The residential cabinet industry can be subdivided into new construction and repair and remodeling. In addition, the industry structure can be further subdivided into custom cabinets, semi-custom cabinets and stock cabinets.

Custom cabinets are those cabinets built to meet the specific requirements of the individual customer. Semi-custom cabinets are those cabinets to which special features can be added but the major construction aspects of the unit remain unchanged. Stock cabinets are those items which are only available in set configurations. Statistics on each sector indicate varying sales performance for 1995.

Sales of custom cabinets represented 20 percent of the total cabinet industry sales dollar volume in 1995, down slightly from 1994, a record year (Adams 1996). On the other hand, semi-custom cabinets accounted for 19 percent of total dollar sales volume, for the same period, up from 16 percent in 1990. Stock cabinets climbed to 61 percent up from 58 percent 1990 with only 22 percent of firms accounting for 80 percent of domestic sales.

Distribution in the cabinet industry is conducted primarily through three major channel structures. The largest segment is controlled by retail cabinet dealers which account for 31 percent of all domestic sales. Second is a system of distributors who account for 30 percent of all sales and direct sales to builders and contractors represent 18 percent of the total.

A high degree of personal service and education of consumers about the qualities of a particular company's products are very important factors in the consumer's buying decision. If the level of service is appropriate, the consumer may be willing to pay more for an individual company's products over those of the competition. If the consumer does

choose to pay more, a high degree of service is essential in order to ensure positive word of mouth promotion; the lifeblood of these companies.

Furniture⁷

U.S. wood household furniture production and shipments have remained relatively constant over the last 10 years if measured in deflated dollars. A low point in U.S. industry shipments at almost eight million dollars (5.9 million in 1982 U.S. dollars) came in 1991. This year also marked the end of a recessionary period. Since that time the U.S. economy has slowly recovered with furniture shipments increasing to an estimated \$10.6 billion in 1995.

The U.S. industry produces a variety of products classified as wood household furniture. Major furniture categories include wood living room and family room furniture; wood dining room and kitchen furniture (excluding kitchen cabinets); wood bedroom furniture; infant and children's furniture; outdoor, unpainted and ready to assemble furniture. Living room furniture accounts for approximately 20 percent of value of shipments; dining room and kitchen furniture is 20 percent; bedroom furniture is 31 percent; infant and children's furniture is 4 percent; and outdoor, unpainted and ready to assemble furniture is 14 percent.

There have only been a few changes over this ten year period in the types of furniture products that have been produced in the United States. One of the most significant changes has been in the amount of ready to assemble furniture. This type of furniture is assembled by the consumer at home. Innovations including 32mm system processing, composite panels and overlay application processes have aided the design and production of these products. U.S. manufacturers have achieved an advantage in this market by installing highly productive manufacturing lines and by maintaining a price advantage on a low profit margin product. Today producers are trying to upscale a typically low price product by including wood veneers and solid wood trims and moldings.

The U.S. Household Furniture Industry Overview

The U.S. household furniture industry remains highly specialized in all sectors. A loss of some market share to manufacturers outside the industry has continued in the wood television and radio cabinet industry, where external entrants have entered the market place.

Household furniture industry shipments rose 6.1 percent in 1992, with 10 percent fewer employees. Increased demand led to a 2.2 percent rise in hours worked by production workers, who were compensated with a 6.6 percent rise in wages. In the wood sector, the largest category with \$8.7 billion of product, shipments increased 7.6 percent from 1987-1992 with a simultaneous drop in employment of 10.8 percent.

⁷ From: Economic Industry Reports, Inc. 1995. The U.S. Household Furniture Industry -An Economic and Market Study. Volume II. 1995 Edition. Raleigh, NC.

Purchasing Patterns

- As income rises, a significantly larger share of expenditures is spent on furniture. Consumers aged 45-54 spent the most for furniture followed by those aged 35-44 and by consumers 25-34 years of age.
- The fastest growing segment of the population for the next decade is projected for those aged 45-64, who will number 59,900 million by the year 2000.

Distribution Trends

- The South is home to 41.4 percent of the nation's household furniture manufacturing facilities, increasing its ranks by 11.9 percent between 1989 and 1992. All regions experienced double-digit growth during this period with the exception of the Northeast, which contracted by 2.4 percent. Of the 501 new manufacturing facilities opened in 1992, 225 units were located in the South, 128 in the North Central, 110 in the West and only 38 in the Northeast.
- North Carolina posted the largest gains in household furniture manufacturing plants in 1992 versus 1991, growing by 63 units to a total of 604 plants. The largest concentration of factories, however, remains in California with 845 facilities.
- After a 5.2 percent gain in sales for 1993, merchant wholesaler sales of furniture and home furnishings appear to be slowing, with a 2.8 percent rise estimated for 1994. While sales are moderating, wholesalers expanded their work force by an estimated 7.4 percent in 1994.
- The nation's retail furniture stores rebounded from a two-year slump by registering sales gains of 3.8 percent in 1992, 11 percent in 1993 and 7.5 percent for the first ten months of 1994.
- On a regional basis, the Midwest reported the strongest gains in retail furniture and home furnishing store sales, up an estimated 17 percent in 1994. In contrast, the Northeast was the weakest region with a respectable 8.3 percent rise in sales.
- After a three-year layoff period, furniture stores began to hire employees in 1993, increasing payrolls by 3.6 percent and adding an estimated 26,000 new hires in 1994.

Market Share Trends

Although 500 household furniture manufacturing plants came on-stream in 1992, the total number of plants in operation remains 89 facilities shy of 1987's level. Most new facilities are small - run by just one to four employees.

The consolidation within the household furniture industry from 1982-87 (latest available data) has boosted the market share for the four largest companies in the mattresses and bedsprings sector which acquired an additional 10 percent share of the market. Upholstery companies gained a 7 percent market share, wood household furniture companies a 4 percent share and 2 percent for metal household furniture. The four largest companies lost market share in the wood TV and radio and household furniture other than wood or metal classifications.

Product categories that have attracted the most new entrants to the business (with sales of \$100,000 or more) from 1987-92 include wood wall units; wood record or music cabinets; wood dining room and kitchen furniture (except cabinets); wood beds; wood conventional water beds; wood chests of drawers; metal bed frames; innerspring mattresses other than crib size; bed foundations; and television cabinets and combinations.

The household furniture industry must continue to efficiently meet customer's needs through quality products, limited price-increases, improved delivery service, professional sales personnel, creative financing programs, and updated gallery presentations, in order to maintain sales and profit margins under fluctuating market conditions.

Wood Household Furniture

On an inflation-adjusted basis, shipments of wood household furniture peaked in 1978. By the end of the 1980-82 recession, shipments were down 24 percent. The consequent recovery boosted sales to within 2 percent of their record highs. From 1987-91, real shipments were on a downtrend, with declines accelerating each year through 1991 as sales bottomed 12 percent below 1987 levels. Shipments rebounded by 2.9 percent in 1992, 6.1 percent in 1993 and 3 percent in 1994, but have not exceeded 1987's levels. Factoring in prices, dollar sales recovered by 5.4 percent in 1992, 10.1 percent in 1993 and a further 7.5 percent in 1994 as sales reached \$9.5 billion.

Burgeoning demand was also met by foreign sources as wood household furniture imports soared 19 percent in each of the last two years capturing 22 percent of the market. The expected slowdown will limit growth over the next five years to annual gains of 3.9 percent bringing sales to \$11.5 billion by 1999. Recent strength has been noted for the following product categories - cabinets, rockers, wall units and credenzas, china and corner cabinets, wardrobes, conventional waterbeds, infants and children's bedroom furniture and ready-to-assemble furniture, particularly home entertainment centers.

Upholstered Household Furniture

Upholstered household furniture was the only sector in the industry that did not see dollar sales declines in the past recession while unit shipments were off just 2.7 percent from 1989 highs. Moreover, price-adjusted shipments advanced a hefty 6.2 percent in 1992 with estimated gains of 8.1 percent in 1993 and 5.8 percent in 1994. To meet production demands, 2,200 new positions opened, as the factory work force expanded by 7.9 percent.

While this stellar performance cannot be maintained, a 1.4 percent annual unit growth rate is projected for the next five years as dollar volume reaches \$9 billion by 1999 advancing at a 4.9 percent pace.

Exports

Renewed strength in overseas markets enabled U.S. household furniture manufacturers to boost export sales by an estimated 12.8 percent in 1994 to \$1.3 billion. Exports accounted for an estimated 5.8 percent of total household furniture shipments in 1994 and are projected to rise to a 7.6 percent share by 1999, supported by demand from world economies.

Wood household furniture remains the largest export category at 45 percent of dollar volume while the fastest growing category is household furniture parts. International markets are the most significant for household furniture other than wood or metal, with 29 percent of shipments sold to overseas customers.

Canada remains the industry's largest consumer, with 1994 purchases reaching an estimated \$585 million, representing 44 percent of aggregate export dollars. Mexico, in second place, accounted for 14 percent of exported household furniture or \$184 million for the year. Mexico bound products surged 44 percent in 1994, while in contrast, Canada's consumption rose by a modest 2.1 percent. Both countries, positively affected by tariff reduction and the NAFTA agreement, have doubled their share of total U.S. exports in the past eleven years.

The Japanese economic recovery led to a 45 percent rise in household furniture purchases in 1994 to \$76.8 million. Other leading export markets are Saudi Arabia (\$87 million), the United Kingdom (\$36.9 million), Taiwan (\$28.1 million) and Germany (\$25.2 million). With 78 percent of the industry's exports confined to only seven nations, there is room for marked expansion as new trading partners are pursued. For example, Argentina, the Netherlands, Kuwait, Venezuela and Colombia have grown from negligible consumption in 1990 to a combined 5 percent share of total exports in 1994.

*Ready-to-Assemble (RTA) Furniture*⁸

In 1990, an exploratory study of ready-to-assemble (RTA) furniture producers was undertaken by Sinclair et al. to better understand the importance of this industry in terms of sales growth, marketing practices, and material use trends. Sales growth has been rapid. From 1986 to 1987, sales increased 24 percent; from 1987 to 1988, sales grew 17 percent.

⁸ From: Sinclair, Steven A., Mark W. Trinkla and William G. Luppold. 1990. Ready-to-Assemble Furniture: Marketing and Material Use Trends. *Forest Products Journal*. 40(3). pp. 35-40.

RTA furniture sales are handled primarily by manufacturer's representatives and captive sales staffs. Most sales are direct to retailers with furniture specialty/lifestyle stores, home improvement centers and discount mass merchants being the leading retailers.

Buyers positioned their products mostly on value and quality while service and price-related attributes were much less important. Industrial particleboard, wood veneer, hardwood lumber, medium density fiberboard and high density laminates were predicted to be the fastest growing materials used in RTA furniture. There is a strong high quality aspect of the RTA furniture market and the use of wood veneer and hardwood lumber is associated with this better quality RTA furniture.

Ready-to-assemble (RTA) furniture is specifically designed and manufactured to be sold in a flat package, which allows consumers to take it home or to the office and assemble it themselves. Shipping furniture unassembled lowers costs by eliminating assembly costs and reducing shipping costs. The savings and assembly are then passed, in part, to the consumer in the form of a lower purchase price. RTA furniture evolved from knock-down (KD) furniture, which has been on the market for many years. As a result of new materials, new manufacturing techniques, new fastening hardware, and updated styling, modern RTA furniture is a dramatic improvement over yesterday's KD furniture. RTA furniture has gained rapid acceptance and is now thought to be the fastest growing segment of the world's furniture market.

In 1986, RTA furniture shipments grew by 20 to 25 percent over 1985 according to a survey of manufacturers, and these manufacturers expected similar gains in 1987. Estimates of 1986 RTA factory shipments (including imports) ranged from a conservative \$500 million to \$1 billion. Thus, RTA furniture would have represented from 3 to 6 percent of total shipments of \$ 16.69 billion by the entire U.S. household furniture industry in 1986. Moreover, other estimates of RTA sales were much higher, up to \$2 billion at retail, suggesting that RTA furniture may have represented closer to 12 percent of total household furniture shipments in 1986. With mostly limited and sometimes conflicting information available on RTA furniture markets, clearly more information is needed to better anticipate and plan for changing demands for wood products. Composite wood products are increasingly being used in furniture and RTA producers acknowledge their dependence on composite panels. In addition, RTA furniture is likely to be marketed and distributed differently than traditional assembled furniture. All of these factors make the study of RTA furniture important to the forest products industry.

Wood Material Use in the U.S. Furniture Industry: 1990 to 1992⁹

United States' wood household, upholstered and wood office furniture manufacturers were sampled to assess the volumes of several raw materials used in wood furniture in 1990 and to predict the volumes to be used in 1991 and 1992. Total hardwood lumber

⁹ From: Forbes, Craig L., Steven A. Sinclair and William G. Luppold. 1993. Wood Material Use in the Furniture Industry: 1990-1992. Forest Products Journal. 43(7/8). pp. 59-65.

used in wood furniture was estimated at over 2.4 billion board feet in 1990. Use was expected to increase 13 percent from 1990 to 1992. Softwood lumber used in wood furniture in 1990 was estimated at over 839 million board feet. A 6 percent increase in softwood lumber use was expected from 1990 to 1992. Red oak was the most commonly used hardwood species and southern pine was the most used softwood. In 1990 wood furniture manufacturers consumed over 1.2 billion square feet of particleboard (3/4-in. basis), 248 million square feet of medium density fiberboard (MDF) (3/4-in. basis), 125 million square feet of hardboard (1/8-in. basis) and 318 million square feet of OSB/softwood plywood (7/8-in. basis). Furniture manufacturers expected a decrease in particleboard and MDF use, and an increase in hardboard and OSB/softwood plywood use from 1990 to 1992.

Trends In Furniture Consumption and Industry Development¹⁰

The United States is the single largest market for furniture products of all prices. The furniture industry in the United States has experienced favorable markets since 1990 due to recovery from recession, low inflation rates, low interest rates, and pent up consumer demand. Prior to this time the furniture industry in the United States went through a period of consolidation with frequent corporate buyouts, mergers, and closures due to recessionary pressures and low asset valuation of many major furniture corporations. U.S. furniture designers continue to set trends for furniture products produced around the world with the world's largest furniture market and permanent show room located in High Point, North Carolina. Manufacturers have made improvements through innovative processing technology and material use to provide high value products demanded by U.S. consumers.

Oak and cherry continue to be the most popular woods with U.S. consumers. Oak is particularly strong at the lower and middle price points. At the high end, cherry is the favored wood for use, particularly in 18th century styles. For all products and price levels finishes in medium tones are selling best in the current U.S. market. However, lighter finishes in case goods are growing in popularity.

Ready-to-assemble furniture is growing and maturing as a product line. It does not look like RTA anymore. Many pieces are difficult to tell from traditional goods. RTA shipments in the United States are forecasted to grow by more than 10 percent annually over the next two to three years. Much of the recent growth in this market is due to demand for medium to upper-end home theater and home entertainment pieces, followed by home office and youth bedroom.

The home theater market is still just a small segment, but it is growing at 10-12 percent per year. Factory shipments are valued at an estimated \$170-180 million last year. Consumer electronics is a growing industry, typically supported by upper income consumers under 50

¹⁰ From: West, Cynthia D. and Bruce G. Hansen. 1996. Trends in Furniture Consumption and Industry Development in Pacific Rim Countries with Specific Reference to the United States, Japan and China. Malaysian Timber Industry Board Furniture Symposium. March 8-9.

years of age. In the future, home theaters will be part of a media room which will accommodate computers, entertainment electronics, home security systems, etc. Furniture systems will be designed to integrate electronics into our lives and hide the wires. The media room will evolve from today's standard living room, be less formal, and accommodate a changing lifestyle that will depend on computers and electronics to entertain and conduct business from home.

The latest trends in consumer case goods include casual elegance, large scale bedroom pieces, eclecticism, youth furniture, and casual dining. In the next year look for the following trends in U.S. furniture markets:

- In bedroom furniture, large statement beds with similarly scaled night stands, dressers, and armoires.
- Increasing market for youth bedroom furniture.
- Increase in casual dining furniture and round dining tables.
- Decrease in demand for china closets.
- Expanding sales for mid priced home theater walls.
- Demand for multi-functional armoires which accommodate televisions for the bedroom.
- Consumers want stylish home office furniture at moderate prices.
- Consumers will be seeking a home that helps them to relax and escape the stress of the workplace by purchasing furnishings with a more casual style but with elegant features. This may include more distressed finishes and more casual hardware on traditionally styled furniture.

Pallets¹¹

The pallet industry is one of the major forest product industries in the United States. The industry is the largest consumer of domestic hardwood lumber. In addition, the demand for wooden pallets in the United States is constantly increasing.

Distribution of Firms

In 1990 there were approximately 3,222 pallet firms in the United States. However, it is estimated only 2,180 firms actually produced pallets during 1990. Michigan and Pennsylvania had the largest number of firms, with more than 200 firms. By Bureau of Census Region, more than one-third of the firms were in the North Central regions. In comparison with 1980 and 1985, the number of firms were up, nationwide, more than one-third.

Annual Pallet Production

In 1990, there were approximately 460 million pallets produced in the United States. The average number of pallets produced per firm doing business in 1990 was 211,600 units. However, the median number was 100,000 units. The mean of 211,600 units was skewed by several firms producing over one million pallets. Forty percent of the firms were producing more than 140,000 pallets annually.

The average annual production per firm varied considerably by Bureau of Census region. The highest average annual production per firm in 1990 was in the West South Central region and the lowest in the New England region. In comparison with 1980 and 1985, the annual pallet production per firm in 1990 was up significantly (112,000; 193,000; 211,600, respectively). In addition, the total pallet production for the United States increased two-thirds over the past ten years.

Market Area

The average distance the firms sold most (85 percent) of their pallets in 1990 was a 92 mile radius from the plant. However, the median distance was only 50 miles—the average being skewed by a few firms that sold nationwide. The average distance in 1985 was 100 miles, with a median of 50 miles. In 1980, the firms were asked to give the number of states in their market area. Sixty-one percent of the firms sold pallets only within their home state during 1980.

Raw Materials

The firms in 1990 generally purchased more than one form of raw material (wood). Seventy-three percent purchased some or all of their wood as lumber. Stumpage, logs

¹¹ From: McCurdy, Dwight R. and John E. Phelps. 1991. *The Pallet Industry in the United States 1980, 1985 and 1990*. Department of Forestry. Southern Illinois University at Carbondale.

f.o.b. mill, and cants were the other forms of raw material. The percent of firms purchasing the different forms of wood varied considerably by region. The amount of wood used in manufacturing the pallets was reported to be 17.3 board feet, on average, in 1990 -- compared with 17.7 board feet in 1985. Seventy-one percent of the wood used in pallets during 1990 was hardwoods. Only 8 percent of the firms reported using no hardwood species.

Hardwood Wood Components^{12 13}

Hardwood components such as dimension parts are dried and processed to a point where the maximum waste is left at the wood components mill, and the maximum utility is delivered to the customer. They are manufactured from rough boards, bolts, cants or logs of varying thickness to the specific requirements of a particular product or use. Wood components specified by thickness, width and length or multiples thereof..

Semi-machined wood components are rough parts that have been carried one or more steps further in the manufacturing process. These processes may include one or more of several woodworking operations including edge or face gluing, surfacing, moulding, tenoning, turning, sanding, trimming, mitering, boring, embossing, shaping, routing and carving and may even make the product a completely machined part ready for final assembly. Fully machined wood components are completely machined with no additional machining or work to be done prior to assembly except for a final polish sanding operation prior to staining or painting.

Most hardwood wood component products are used for household and office furniture, kitchen and bath cabinets, decorative building materials, millwork and a wide variety of other types of specialty wood products. Included among the typical wood products produced by wood components manufacturers are cut-to-size blanks, edge-glued panels, solid or laminated squares, mouldings, turnings, bendings, upholstered frame stock, interior trim, millwork, stair treads and risers and a wide variety of component parts for the kitchen and bath cabinet industry, such as cabinet doors, face frames and drawer sides and fronts.

In a recent study by Vlosky (1996), most used species (by volume) were red oak, poplar, white oak, maple and cherry. Poplar's number two ranking is consistent with national figures indicating that from 1987 through 1990 there was a significant increase in the use

¹² Lawser, Steven V. 1992. Resource Guide for Hardwood Wood components Manufacturers. Mountain Association for Community Economic Development. Berea, Kentucky; 1993. Forecast 1994. National Hardwood Magazine Vol. 67 No. 12, pp. 91-92 (16); 1994. Discovering New Wood components. Wood Digest. December. pp. 29-30; 1994 Value-Added Opportunities for US and Canadian Woodworkers. Proceedings of the 22nd Wood Technology Show and Clinic. Portland, Oregon. March 23-25.

¹³ Vlosky, Richard P. 1996. "Characteristics of U.S. Hardwood Wood Component Manufacturers." Forest Products Journal. Vol. 46. No. 5. pp. 37-43

of yellow poplar as a substitute for softwoods in the production of interior trim, mouldings and millwork.

A recent survey indicated that furniture wood components stock in 1991 accounted for 42.2 percent of total shipments, with kitchen and bath cabinet components accounting for 32.9 percent of the total. That survey showed a significant increase in hardwood components being used in various building and remodeling products, such as interior trim, mouldings, millwork, staircase parts and flooring. This category accounted for 15.7 percent of all wood components products produced in 1991, up 40 percent from the previous year. A variety of decorative products and specialty type wood components products, such as wall plaques, picture frames, toys and gift items, accounted for 4.7 percent of the total business (Lawser, various dates).

Treated Wood Products

Wood products are referred to as treated after receiving a preservative treatment intended to improve the utility of the wood in a given application. Preservatives make wood toxic to organisms that use it for food or shelter; fire retardants reduce flame spread and prevent wood from supporting its own combustion; water repellents slow moisture changes in wood; while other chemicals make wood resistant to acids and alkalis or modify its characteristics for special applications (Graham 1973¹⁴).

Typically, the term is used for pressure treated lumber, timbers, plywood and other specialty wood products. In pressure treating, preservative chemicals are forced into wood physiological structures inside a steel pressure chamber (Smith 1988¹⁵).

Although a number of chemical applications are available for use in the pressure-treatment of wood, chromated copper arsenate (CCA) is most prevalent. CCA, a waterborne wood preservative composed of metallic salts, was used in approximately three-fourths of the treated wood market in 1987 (Micklewright 1991, 1989¹⁶).

Treated wood products were included in the study because of their unique product applications relative to untreated products and because approximately 80 percent of

¹⁴ Graham, Robert D. 1973. "History of Wood Preservation". Wood Deterioration and Its Prevention by Preservative Treatments. Volume I. Degradation and Protection of Wood. Syracuse Wood Sciences Series, 5. Wilfred A. Cote, Editor. Syracuse University Press. Syracuse, New York. pp. 1-30.

¹⁵ Smith, P.M. 1988. Ph.D. Dissertation. "An Analysis of the Retail Customer for CCA Pressure-Treated Lumber, Timbers and Plywood". Virginia Polytechnic Institute and State University. Blacksburg, Virginia. pp. i.

¹⁶ Micklewright, James T. 1991. Wood Preservation Statistics, 1991. A Report To The Wood Preserving Industry In The United States. American Wood Preservers Association. December; 1989. Wood Preservation Statistics, 1987. A Report To The Wood Preserving Industry In The United States. American Wood Preservers Association. December.

treated lumber (which constitutes three quarters of the total treated lumber, timbers and plywood produced) is sold through the retail distribution channel.

The study region has an abundance of softwood resources that could be treated and further processed.

Overall Forest Products Industry Competitive Situation¹⁷

Raw Materials

Southern pine timber size and quality will continue to decrease as more pressure is placed on the region to replace anticipated production declines in the Northwest. Although sufficient timber may exist for 10-year plans, the rate-of-price increase will rise by the end of this decade. Hardwood supplies should remain stable provided no major industrial market developments are made. Softwood lumber will continue to be restricted in width and length because of the reduced availability of larger saw timber. One factor contributing to softwood saw timber availability will be the continuing short rotation trend on pine plantations producing primarily pulpwood.

Manufacturing Technologies

The single most important trend in the industry is the development of composite wood products. New leading-edge manufacturing technologies are being developed and will become a dominant factor in the future. Opportunities exist for smaller firms to establish support facilities to convert intermediate products into more usable forms. Examples of these support facilities include (but are not limited to) dimension stock producers, millwork, timber laminating, end- and edge-gluing, and surface overlaying. Additionally, technologies will continue to emerge to support the use of Southern species as replacement for Western species used in these composite products.

Market Directions

Housing starts should remain in slow growth over the long term but will continue to support a large segment of the wood products industry. Repair and remodeling should continue to grow. Products should be planned to support do-it-yourself suppliers as well as other markets. Industrial markets will continue to show fragmented growth as the primary support products change to more engineered composites. These technology based products will continue to grow at a rapid pace during the 1990s with slower growth after the turn of the century. Significant increases in nonresidential construction will depend on the ability of these composite products to compete on price and performance with alternative building materials. Exports of pulp and chips will likely increase as other countries increase paper

¹⁷ Syme, John H. and Charles R. Duke. Forest Products Research Initiative for Abbeville and McCormick Counties in South Carolina. Department of Forest Resources. Clemson University. December 1991.

production. Export lumber sales will likely shift toward dimension stock or other secondary products to reduce shipping costs.

Competition

Competition within commodity product markets will continue to be fierce. Imported wood products will continue to be a major competitive factor, such as radiata pine lumber and secondary products from Chile and New Zealand as well as Canadian softwood lumber. As a result of this continuing pressure on commodity products, an increased emphasis is being placed on secondary manufacturing by both businesses and economic developers in several western, southern, and northwestern states. Market niches will emerge to meet market needs by providing additional value-added production or services. New product development will be required to convert commodities into products which can be readily applied by the user. Where possible, integration of businesses into informal and formal networks will provide smaller companies with the ability to compete and will provide larger companies with the diversity to change quickly to meet market needs.

Partnerships with material suppliers and product purchasers will continue to increase. At the retail level, resellers seem to be satisfied with their current suppliers and products. It appears that a new manufacturer of end-user retail products may have difficulty breaking into this distribution channel. The keys to success in secondary products are manufacturing a high quality product, pricing that product competitively, and then providing unbeatable service to the customer. This simple but hard-to-achieve success formula for manufacturers of any product is expected to be the dominant thinking in the next decade.

Market Opportunities for Study Region Value-Added Manufacturers

Overview

This phase of this research project analyzes specific industry sectors and market opportunities for those sectors. Target markets and related products were evaluated on a general set of criteria including market issues (size, growth, technology, competition) and operational issues (required facilities, infrastructure, capital requirements, raw material access, and distribution needs). Additionally, considerations were made to optimize the match of the products and markets with the strengths of the subregion. This last criteria allows the strengths, weaknesses, and opportunities of the region to be considered. Timber species utilization, technological innovations, demographic data (employment, skill of labor force), existing infrastructure, pollution potential, other environmental impacts, and financial capabilities were all analyzed to match potential products to existing and future resources.

In application, a number of factors were operationalized by developing measures to empirically test these issues at the industry level in the region. Examples of such factors included: raw material purchase decision criteria (Forbes et al. 1994), species availability for raw material inputs (Luppold and Dempsey 1994), product and supplier attributes (Bush

et al. 1991), markets and market trends (Anon 1994), criteria for geographic location selection (McKee 1989) and export activity.

A major factor in determining the probability of industry success is the market structure for current or potential value-added solid wood products. In this section, a market analysis is conducted with resulting recommendations on high probability product sectors. Objectives for this component of the research methodology are to conduct secondary market research on major product groups and identify products with a high potential for successful expansion or development (Figure 2). Beyond identifying attractive segments for value-added sector development, Figure 2 indicates (on the right of the arrow) corporate-level issues that need to be examined before investment and growth should take place.

In order to examine the attractiveness of participating in the forest products industry, it is important to understand the overall drivers of product supply and demand. Accordingly, an analysis is conducted of the macro-demand drivers (housing starts, interest rates, global supply and demand, demographics, etc.) for wood products demand and the outlook for major raw material markets (lumber and panels) and finished products for the secondary wood products industry.

Corporate-level market strategy tools were adapted and applied in the research for both identification of competitive factors that can stimulate industry sector growth and to identify domestic and export opportunities. This market analysis can aid in making recommendations on industry development strategies and target market entry and development strategies.

The Business Growth Environment

A major factor in determining the probability of industry success is the market structure for current or potential products. As discussed earlier in the resource assessment and analysis of solid wood products industry structure, overall there is an ample supply of raw materials and an established industry infrastructure to support further expansion. Market based criteria were developed to assess potential wood products and industry segments and to select those that appear to have the best long-term potential for implementing this expansion. The criteria used were:

- raw material availability and access
- available markets (local, regional, national or global)
- market growth rate
- competitive factors
- provides employment opportunities
- distribution infrastructure exists or can be developed
- manufacturing facility requirements
- Infrastructure requirements
- waste facilities requirements (sewers, landfills)
- capital requirements

- workforce skill requirements

One goal is to identify factors that would encourage recruited firms to relocate in the region or expansion of current companies. A study of the secondary industry conducted by Advanced Strategic Research, Inc. indicated that the key individuals involved in plant location decisions are the president and vice-president of manufacturing. The decision process of large and small firms are quite different. Larger manufacturers typically have more individuals involved, require more information, and take a longer time to reach plant location decisions than smaller manufacturers. Personal preferences and personal selling efforts from economic development entities tend to play a more important role in the decisions of smaller furniture manufacturers. They found that the overriding decision factor in location decisions is the labor supply. Larger furniture manufacturers are most concerned with having an available, trainable labor force, while smaller manufacturers look for an existing supply of skilled labor. Technical assistance in the area of training is valued by both. Non-union labor is much more attractive to furniture manufacturers, to the point where some are hesitant about locating a new plant in an area that has a strong union sentiment.

Other important factors in selecting a site for furniture manufacturing plants were distribution/transportation and access to raw materials. The primary form of transportation of concern to manufacturers is trucking, therefore, a potential location is considered attractive if it provides good access to major North/South and East/West highways and major trucking lines. Although proximity to raw materials is important to both large and small manufacturers, it is more critical to smaller manufacturers.

The keys to success in secondary products are manufacturing a high quality product, pricing that product competitively, and then providing unbeatable service to the customer.

Market Opportunities for Study Region Manufacturers

The study region is faced with several unique opportunities with which to pursue future development of the secondary forest products industry. Seven commercial timber species have been identified with moderate to high commercial value. Another four species would be considered as low commercial value.

However, even those low commercial value species represent significant opportunity in that these species are used in a variety of utility grade applications such as pallets, crates, boxes, marsh matting, baskets, promotional furniture and cabinets. In addition, research is currently underway on the feasibility of short rotation fiber farming utilizing cottonwood in paper making processes. We will discuss the applications of each species and provide tentative recommendations for strategic development.

Target Species

Southern Yellow Pine

As stated earlier, Southern yellow pine is the most plentiful species in the region. Pine is used in many applications far too numerous to list here. However, construction applications are by far the most plentiful. Many foreign markets utilize high grade pine in interior millwork, doors, and vertical grain flooring materials. While the principal users of pine located in the region are paper producers, numerous suppliers of the material are located in close proximity to the study region. Further, because a number of the region's hardwood producers are currently shipping to flooring producers, we suggest that an attempt be made to promote the region as a likely location in which to locate a cut up operation either as an industrial recruitment effort or preferably as an integration effort of an existing operation.

However, a caveat is in order. Because there exists immense global demand for pine fiber one must be concerned with future resource availability. There are a number of perspectives concerning demand for pine, but the fact remains that there will continue to be high demand for the product. However, companies which face increasing competition in their current market segments may be interested in accessing new markets. Existing companies which have experience in flooring, furniture and architectural millwork markets may offer an opportunity for joint ventures and provide additional development for the region.

Ash

Data on this species indicate there are commercially viable quantities available in the region. There are two primary types of ash in the region, white and green. In general, the two species are not sold separately in the market; they are both sold simply as ash. Ash is considered a moderate to relatively high value wood depending on the grade. This wood is used in a number of applications such as cabinets, furniture, boxes and bats, to name a few.

The important point is that this species is currently being produced in the region in both green and kiln dried products as well as rough and surfaced. Again as a furniture and cabinet material the availability of this resource and ready acceptance in current markets provides the opportunity for vertical and horizontal expansion strategies for existing companies as well as industrial recruitment opportunities with companies currently purchasing from within the region.

Especially attractive are opportunities for cut-up operations and components parts production for the furniture industry and architectural millwork. In addition, flooring applications would be another favorable application because many pre-manufactured or pre-finished flooring products can use very short pieces in manufacturing. This characteristic allows for use of lower grades. Greater value-added from marginal lumber can be realized.

Cottonwood/Basswood

This species is a fast growing bottomland species with numerous applications. A moderate to high value lumber product, it is used in cooperage, crates, boxes, caskets, concealed furniture parts as well as panel product production and excelsior (a packing material). A more recent use of cottonwood is in high grade paper production. This species has the ability to regenerate from twigs and limbs. In addition, the trees grow to merchantable size in about 6 - 8 years under good growing conditions. Ongoing silviculture research on this species indicate southeastern United States river bottom sites provide ideal locations for the growth of this valuable renewable resource. Given that world wide demand for paper continues to trend upward and government subsidies for certain row crops are beginning to be decreased, this species may well represent an opportunity for land use shifts into short rotation cottonwood farming. Such land use practices would create additional forest industry development opportunities for the region.

Elm

Available data on this species indicate that virtually all size class categories have increased in volume in the region. Both elm types, American and winged, are generally considered as utility woods and are of relatively low value. However, they are used widely in such applications as promotional furniture, pallets, boxes, various container applications and baskets. While low cost, this wood is widely used in the pallet industry and other transportation applications.

Sweetgum

This ubiquitous species is found through out the southeastern United States in copious amounts. However, in the study region data indicates that quantities of most size classes of this species are increasing. A low value lumber product, the veneers produced by this valued significantly higher. This increased value as a veneer may result from even graining and the woods ability to stain well. Sweetgum is used extensively in furniture, cabinets, millwork, baskets, railroad ties and marsh matting.

Red Oak

This very high value species is used in numerous high value-added applications including flooring, furniture, cabinets and millwork. Low grade red oak is used in many utility applications including railroad ties, marsh matting, pallets and crates. Conversations with producers of red oak lumber in the region indicate that this species is being shipped throughout the United States and around the world. Only the pines represent as broad a spectrum of development potential as this resource.

One of the major complaints about southern hardwoods is that there is tremendous color variation, mineral staining and inconsistent late wood ring growth. However, even with these shortcomings, brokers of southern hardwoods report that the availability of long lengths overcomes the other problems in most applications. The fact that so much of this

resource is shipped to furniture, flooring , millwork and conversion van applications testifies to the ready acceptance of the region's red oak lumber in the world market. Because of the very high value of the region's red oak resource and its ready acceptance, extensive efforts should be made to promote further value-added in those sectors which use this material, especially in the furniture, millwork, flooring, pallet and marsh matting product sectors.

White Oak

While this valuable hardwood is not as plentiful as the red oak species and there has been some depletion in the intermediate size classes, there remains a significant volume of white oak in the region. One company reported it sells all the white oak it can produce to regional customers. Another company reported export demand for white oak to be very high. In general, white oak is used in the production of furniture, flooring, cabinets, railroad ties and cooperage. Again, because of the very high value-added potential of this species, those companies currently engaged in its production should be targeted for vertical or horizontal integration opportunities as well as assisted in expanding export opportunities for component parts and dimension stock production.

Other Utility Grade Species

Four other commercially viable species found in the region are considered utility grade species. The utility classification is based on wood characteristics of the species and not simply on the basis of grading. The woods are 1) sugarberry (hackberry), 2) tupelo-blackgum, 3) water hickory, and 4) willow. In general, these woods are of low value.

The development potential of this group as a whole is significant because of the combined volumes of the four species. However, because these species are bottomland species availability may be a problem due to flooding and general wetness of the areas in which these species thrive. However, because these species are used widely in pallets, crates, marsh matting and other similar applications their value for jobs creation cannot be overlooked.

Comparative Product Sector Analysis

In order to identify those market segments that hold the greatest promise for development in the region, a comparison of criteria discussed earlier was conducted. For each of the criteria, a weight from 1 to 10 was assigned. This weighting scheme, which is consistent for all market segments analyzed, was developed from information gathered in the resource assessment, industry structure and market analysis sections of the research project as well as interviews with industry representatives.

Table 4. Summary Criteria Evaluation for Major Product Groups

	Score	Weight x Rating/
Product Sector	Sum of Ratings	Total Possible Score
Hardwood Wood Components	53	75%
Ready-To-Assemble Furniture	52	74%
Architectural Millwork	50	72%
Treated Products	50	72%
Household Furniture	45	65%
Hardwood Flooring	42	61%
Cabinets	39	57%

Hardwood Wood Components

The literature contains a number of studies that examine criteria for selecting hardwood lumber suppliers. For example, in a study conducted by Bush et al.¹⁸, hardwood lumber buyers were asked to indicate the importance of a variety of supplier characteristics. They found that competitive pricing, supplier's reputation and rapid delivery to be important. A study of major U.S. furniture and cabinet manufacturers found that price and product quality were identified as the two leading factors for choosing a supplier by wood component buyers. Other factors include: on-time delivery, dependability of supply, required lead time and species availability¹⁹.

In another study, Canadian hardwood lumber purchasers ranked reliability of supply at the top of the list in ranking the importance of a supplier's ability to provide products and services²⁰. This same study asked lumber purchasers to rank the importance of product and service quality with overall product quality, overall service quality and competitive pricing ranking highest. Forbes et al.²¹, in a study examining furniture manufacturer supplier criteria, found that product oriented factors such as load-to-load consistency,

¹⁸ Bush, Robert J., Steven A. Sinclair and Philip A. Araman. 1991. Determinant Product and Supplier Attributes in Domestic Markets for Hardwood Lumber. *Forest Products Journal*. Vol. 41, No. 1. pp. 33-40.

¹⁹ Anon. 1994. *Wood & Wood Products. Study Links Components Purchases With Profits*. pp. 230-232.

²⁰ Armstrong, James P., Thomas G. Ponzurick and William G. Luppold. Marketing-related criteria affecting the purchase of U.S. hardwood lumber by Canadian importers. *Forest Products Journal*. Vol. 43 No. 6. pp. 57-62.

²¹ Forbes, Craig L., Steven A. Sinclair, Robert J. Bush and Philip A. Araman. 1994. Influence of Product and Supply Attributes on Hardwood Lumber Purchase Decisions in the Furniture Industry. *Forest Products Journal*. Vol. 44, No. 2. pp. 51-56.

accurate grading, absence of warp, crook, and bow and accurate moisture content were most significant, followed by a set of service and relationship oriented factors.

In a recent study by Vlosky²² (1996), the most frequently cited reason that respondents purchase raw material from out-of-state suppliers is product availability. The other two reasons of any consequence are that out-of-state suppliers offer better prices and higher product quality. These findings suggest that if in-state suppliers can increase development of the wood components customer base and offer quality products at competitive prices, more raw materials will be processed in-state, thereby increasing the value-added to the resource. The two most important and equally ranked success criteria for respondent companies are product quality and development of long-term customer relationships. The importance of relationship factors to company success is further indicated by the subsequent highest ranked factors, offering high levels of customer service and overall company reputation. An understanding of the customer base and development of a long-term orientation can be a significant factor in building or maintaining market share.

On the other side of the equation, respondents were asked to evaluate factors that are a hindrance to their success in the hardwood wood components business (Figure 9). The foremost impediment is acquisition of quality raw material followed closely by development of consistent raw material supply. I suggest that these factors can be mitigated if hardwood wood components companies focus on the factors that they themselves identified as contributors to success, particularly those that are relationship oriented. However, in this case, rather than these factors being applied to wood components manufacturer relationships with customers, an upstream perspective needs to be developed with raw material suppliers.

The success and impediment responses can help existing companies improve their core capabilities and market position as well as identify important issues for individuals that are considering entering the hardwood wood components business.

As part of the evaluation process that identifies high potential value-added industries, information about factors that encourage or deter industry location is required. Nineteen factors that influence hardwood wood components industry expansion for existing companies or location decision criteria for companies considering immigration were analyzed. Labor issues (productivity and costs) are deemed most important by study respondents. Subsequent factors, in order of importance are proximity to an adequate and sustainable raw material supply, a favorable tax structure, the availability of a skilled labor pool and an amenable community industrial climate.

Table 5. Hardwood Wood Components

	<i>Weight</i>	<i>Rating</i>	<i>Score</i>
--	---------------	---------------	--------------

²² Vlosky, R.P. 1996. "Characteristics of U.S. Hardwood Wood Component Manufacturers." Forest Products Journal. Vol. 46. No. 5. pp. 37-43.

<i>Factor</i>	<i>(1-10)</i>	<i>(1-10)</i>	<i>Weight x Rating</i>
raw material availability	10	8	80
available markets (local, regional, national or global)	8	8	64
market growth rate	7	8	72
competitive factors	8	8	64
provides employment opportunities	10	7	70
distribution infrastructure exists or can be developed	7	8	56
available workforce	10	6	60
TOTAL		53	450/600=75 %

Ready-To-Assemble (RTA) Furniture

One of the most significant changes in the wood products industry has been in the growth of the ready-to-assemble (RTA) furniture segment. This type of furniture is assembled by the consumer at home. Innovations including 32mm system processing, composite panels, and overlay application processes have aided the design and production of these products.

U.S. manufacturers have achieved an advantage in this market by installing highly productive manufacturing lines and by maintaining a price advantage on a low profit margin product. Today producers are trying to upscale a typically low price product by including wood veneers and solid wood trims and moldings.

Ready-to-assemble furniture is growing and maturing as a product line. It does not look like RTA anymore. Many pieces are difficult to tell from traditional goods. RTA shipments in the United States are forecasted to grow by more than 10 percent annually over the next two to three years. Much of the recent growth in this market is due to demand for medium to upper-end home theater and home entertainment pieces, followed by home office and youth bedroom.

As seen in Table 6, Ready-to-Assemble (RTA) furniture received the highest score of the five segments (442/600 or 74 percent rating). In particular, the high growth rate for this segment in national markets was an attractive attribute. In addition, because no RTA producers were identified in the study region, competitive pressures are low. Price point strategies for RTA furniture is flexible with a wide range in potential pricing and quality.

Raw materials for RTA furniture, including industrial particleboard, wood veneer, hardwood lumber, medium density fiberboard, and high density laminates are all available within a reasonable supply reach.

Table 6. Ready-To-Assemble Furniture

	<i>Weight</i>	<i>Rating</i>	<i>Score</i>
--	---------------	---------------	--------------

<i>Factor</i>	<i>(1-10)</i>	<i>(1-10)</i>	<i>Weight x Rating</i>
raw material availability	10	8	70
available markets (local, regional, national or global)	8	7	56
market growth rate	7	8	63
competitive factors	8	8	64
provides employment opportunities	10	7	70
distribution infrastructure exists or can be developed	7	8	49
available workforce	10	6	40
TOTAL		52	442/600=74 %

The ready to assemble market offers the region's companies an opportunity to vertically or horizontally integrate by providing dimensioned materials and pre-cut parts. These value added products could offer the customer significant savings by reducing the amounts of inventories held at higher costs as well as reduced transportation and waste factor costs over current raw material inventory costs.

The region's planners and developers may assist companies access this opportunity by aggregating the consulting needs of region companies and accessing federal programs aimed at rejuvenating economically depressed areas. In addition, local and state lending institutions should be educated as to the needs and nature of the industry sectors in question. Company managers should be targeted for management training and business plan development.

Architectural Millwork

Following RTA furniture, architectural millwork is another high potential candidate for growth and expansion with a 72 percent rating (Table 7). Both domestic and export markets exist to accommodate such an expansion. In particular, stable growth rates for new private construction and repair and remodel, which account for 49 percent and 47 percent of millwork markets, respectively, indicate steady growth. Raw materials are also not a limiting factor for this segment with ample hardwood lumber, softwood lumber, medium density fiberboard and other inputs available within an effective supply reach.

Value of shipments varied between \$9.0 and \$9.7 billion, making millwork the largest of what are commonly called the secondary solid wood product industries. Of the 95 percent of these shipments which were millwork products: doors (32 percent), windows (27 percent), moldings (12 percent), and other (29 percent). In nominal dollars, comparison of 1989 and 1992 trade data shows that U.S. millwork exports grew from \$ 102 to \$272 million while imports declined from \$310 to \$306 million. The trade deficit in these products declined from \$208 to \$34 million. The composition of exports that are increasing are doors and components and softwood moldings.

Table 7. Architectural Millwork

<i>Factor</i>	<i>Weight (1-10)</i>	<i>Rating (1-10)</i>	<i>Score Weight x Rating</i>
raw material availability	10	8	80
available markets (local, regional, national or global)	8	7	56
market growth rate	7	7	49
competitive factors	8	7	56
provides employment opportunities	10	7	70
distribution infrastructure exists or can be developed	7	8	56
available workforce	10	6	60
TOTAL		50	427/600=72%

Treated Products

Southern yellow pine is the most plentiful species in the region. Much of the volume of Southern yellow pine produced in the South is treated and manufactured into a myriad of products. As supplies of natural insect retardant species such as redwood and cedar decline, the use of treated pine products will increase. We suggest that an attempt be made to promote the region as a likely location in which to locate a treatment facilities and/or manufactured product operations either as an industrial recruitment effort or preferably as an integration effort of an existing operation.

Table 8. Treated Products

Factor	Weight (1-10)	Rating (1-10)	Score Weight x Rating
raw material availability	10	10	100
available markets (local, regional, national or global)	8	7	56
market growth rate	7	7	49
competitive factors	8	6	48
provides employment opportunities	10	6	60
distribution infrastructure exists or can be developed	7	8	56
available workforce	10	6	60
TOTAL		50	429/600=72%

Household Furniture

As income rises, a significantly larger share of household expenditures is spent on furniture. Consumers aged 45-54 spend the most for furniture followed by those aged 35-44, and by consumers 25-34 years of age. The fastest growing segment of the U.S. population for the next decade is projected for those aged 45-64, who will number 59,900 million by the year 2000.

Recent increases in U.S. demand was also met by foreign sources as wood household furniture imports soared 19 percent in each of the last two years capturing 22 percent of the market. The expected slowdown will limit growth over the next five years to annual gains of 3.9 percent bringing U.S. sales to \$11.5 billion by 1999. Recent strength has been noted for the following product categories - cabinets, rockers, wall units and credenzas, china and corner cabinets, wardrobes, conventional waterbeds, infants and children's bedroom furniture, and ready-to-assemble furniture, particularly home entertainment centers.

Although demand growth is tied to an aging population, household furniture is currently the second largest secondary wood products sector in Louisiana after cabinets. The furniture industry is concentrated in metropolitan areas and markets in a fairly narrow radius of about 150 miles. Current demand within existing markets appears to be met leading to a rating of 65 percent (Table 9). However, with additional promotion to end users as well as aid to increase production efficiencies, furniture companies located in the regions may be able to capture a larger share of the existing market.

Table 9. Household Furniture

<i>Factor</i>	<i>Weight (1-10)</i>	<i>Rating (1-10)</i>	<i>Score Weight x Rating</i>
raw material availability	10	8	80
available markets (local, regional, national or global)	8	5	40
market growth rate	7	6	42
competitive factors	8	6	48
provides employment opportunities	10	7	70
distribution infrastructure exists or can be developed	7	7	49
available workforce	10	6	60
TOTAL		45	389/600=65%

The furniture companies located within the study region are by and large very small companies producing one of a kind custom creations. While the majority of these companies are not likely to grow much beyond their current size, some do offer the potential for the production of component parts. Because these craftsmen possess the technical skill to operate in very close markets rife with competition from virtually every

major furniture company in the world, they should not be overlooked for their ability to manage larger operations with component and dimension products capability. In addition, this potential to develop cut-up operations may also represent a logical next step in the evolution of the wood products industry in the region. In that many furniture firms are currently purchasing large volumes of sawn lumber from the region's existing firms the opportunity may well exist for joint ventures between existing companies with the downstream customers. Planners should assist interested parties located in the region in approaching likely customers about such joint ventures or further expansion of existing companies to provide additional services to their existing customer base.

Hardwood Flooring

Data reported by the USDA indicate that the hardwood flooring industry has experienced rapid growth for nearly twenty years. More recent data from the Oak Flooring Manufacturers Association (1997) confirm that the trend in increased hardwood flooring utilization is continuing. Because many of the region's hardwood producers ship dried hardwood products significant distances to flooring manufacturers, there is reason to expect that such a plant located close to the resource would offer companies operating in that market segment significant transportation opportunities over competitors. As seen in Table 10, hardwood flooring production would experience adequate raw material availability and reasonable potential for distribution and transportation infrastructure. However, limiting factors include competition from an established industry in Arkansas and competitive markets.

Table 10. Hardwood Flooring

<i>Factor</i>	<i>Weight (1-10)</i>	<i>Rating (1-10)</i>	<i>Score Weight x Rating</i>
raw material availability	10	8	80
available markets (local, regional, national or global)	8	5	40
market growth rate	7	5	35
competitive factors	8	4	32
provides employment opportunities	10	7	70
distribution infrastructure exists or can be developed	7	7	49
available workforce	10	6	60
TOTAL		42	366/600=61%

Cabinets

The U.S. residential cabinet industry is expected to expand in 1998 with mid-range priced offerings in new construction as the dominant area of growth. In addition, remodeling and repair may also offer opportunities for those companies positioned to take advantage of this market segment.

Because cabinet production is so closely tied to housing, it ranked last of the major product segments examined with a ranking of 57 percent (Table 11). The main reason for such a low rating is that available markets (local, regional, national or global) are narrow and saturated. The fact that the cabinet industry is the largest secondary wood products sector in Louisiana with a strong competitive environment supports a cautious recommendation for expansion.

Table 11. Cabinets

<i>Factor</i>	<i>Weight (1-10)</i>	<i>Rating (1-10)</i>	<i>Score Weight x Rating</i>
raw material availability	10	7	70
available markets (local, regional, national or global)	8	5	40
market growth rate	7	4	28
competitive factors	8	4	32
provides employment opportunities	10	6	60
distribution infrastructure exists or can be developed	7	7	49
available workforce	10	6	60
TOTAL		39	339/600=57%

Market Strategy

Given relative attractiveness of expansion or investment in different forest sector market segments, a logical next step is to discuss possible market strategies. Based on development of generic company-level market strategy options (see Abell and Hammond 1979, Ohmae 1982, Day 1986), Figure 1 depicts the characteristics of each cell in the generic market strategy matrix.

Figure 1.

Generic Market Strategy Characteristics

Competitive Strength

		Competitive Strength		
		STRONG	MODERATE	WEAK
Market Attractiveness	HIGH	Extend Position <ul style="list-style-type: none"> invest to grow at maximum digestible rate concentrate effort on maintaining strength 	Invest to Build <ul style="list-style-type: none"> challenge for industry leadership build selectively on strengths reinforce vulnerable areas 	Build Cautiously <ul style="list-style-type: none"> specialize around limited strengths seek ways to overcome weaknesses withdraw if indications of sustainable growth are lacking
		Build Selectively <ul style="list-style-type: none"> invest heavily in most attractive segments build ability to counter competition emphasize profitability by increasing productivity 	Invest Selectively <ul style="list-style-type: none"> protect existing programs concentrate investments on segments where profitability is good and risk is relatively low 	Limit Expansion <ul style="list-style-type: none"> look for ways to expand without high risk, otherwise minimize investment and rationalize operations
	MEDIUM	Protect & Refocus <ul style="list-style-type: none"> manage for current earnings concentrate on attractive segments defend strengths 	Harvest <ul style="list-style-type: none"> protect position in most profitable segments upgrade product lines minimize new investments 	Divest <ul style="list-style-type: none"> sell at the time that will maximize cash value cut fixed costs and avoid investments
	LOW			

An application of this model to the Northwest Louisiana forest products industry is shown in Figure 2. For hardwood wood components and RTA furniture, the two segments with greatest level of market attractiveness, it is recommended that new investment be made to develop these sectors.

Millwork and treated product manufacturers have a moderate competitive environment and market attractiveness, particularly in niche markets. Accordingly, these segments should be targeted for selective investment where risk is minimized.

Protection of existing furniture and cabinet production sectors is an important part of this strategy. Because of limited geographic markets and applications are recommended for targeted limited expansion. The goal is to expand without incurring risk.

Finally, although opportunities may exist in the hardwood flooring industry, due to competitive pressure from Arkansas manufacturers, this industry should build cautiously.⁷

Figure 2.

Market Strategy Map

Competive Strength

		STRONG	MODERATE	WEAK
Market Attractiveness	HIGH	Extend Position	Invest to Build	Build Cautiously
			<ul style="list-style-type: none"> • Hardwood Wood Components • RTA Furniture 	<ul style="list-style-type: none"> • Hardwood Flooring
	MEDIUM	Build Selectively	Invest Selectively	Limit Expansion
			<ul style="list-style-type: none"> • Architectural Millwork • Treated Products 	<ul style="list-style-type: none"> • Household Furniture • Cabinets
	LOW	Protect & Refocus	Harvest	Divest

**Economic Implications of Forest Products Sector Industry
Development in Northwest Louisiana**

David Hughes

Introduction

The value-added forests products industry has the potential for facilitating economic growth in Louisiana. The industry is growing, local supplies of raw material inputs are readily available, and large viable output markets exist in Louisiana and in the nearby Dallas-Forth Worth metropolitan area. Development of the forests product sector is especially important, because economic activity in many traditional export base industries, such as mining and row crop agriculture, continue to decline in several areas.

This research focuses on estimating the impacts of feasible growth in the value-added forests products industry on the economy of a ten-parish region in northwest Louisiana with an emphasis on the distributional consequences of this growth. The expectation is to provide policy makers with an idea of the sector's possible contribution to total economic activity and to income distribution in the region.

Overview of Forest Products Sector Economic Development

The contribution of the entire forests products sector to economic development, especially in rural areas, is becoming increasingly recognized (Wear and Hyde 1991). This recognition is part of the shift in the focus of federal land management policy to include broader concerns in addition to maximum sustainable wood harvest levels. Besides concerns that relate to economic development, such as income distribution and community stability, federal land management policy has also become concerned with environmental, often nonmarket, effects of land use decisions.

A significant element in the shift has been changes in land management due to the endangered species act (Sample and Le Master 1992). A major concern has been the effect of resulting possible and actual reductions in wood harvest levels at the industry and regional economy levels.

Estimates of job losses at the regional levels as a result of species listing have widely varied. For example, estimated job loss due to the listing of the Northern Spotted Owl in all forested areas in western Washington, western Oregon, and northern California have ranged from 12,000 jobs (Anderson and Olson 1991) to 100,000 jobs (Beuter 1990). Estimates of employment impacts have varied widely because of differences in assumptions about the pace of mill modernization (ongoing substitution of capital for labor) and about alternative employment opportunities in the region for displaced workers (Sample and Le Master).

A question that arises in studying the effects of this and other policies is the impact not only on growth in the regional economy, but also on broader issues of economic development. Economic development can be defined in several different ways. However, the vast majority of the literature on the subject emphasizes the complexity of the process including possible impacts on types of jobs created and income distribution as well as on the more

narrow issue of levels of growth (Todaro 1994). Wear and Hyde (1992) emphasize this point in calling for research that will result in estimates of the distributional consequences of policy actions and industry growth or decline in the forests products industry.

In response, a small but growing body of recent literature is starting to examine the distributional impacts of forest land management. Stevens (1995) used a profit function method to examine the impact of changes in timber stumpage prices on skilled versus unskilled labor in the Washington sawmill industry. He concluded that any increase in stumpage prices would have a larger detrimental effect on unskilled versus skilled workers. Marcouiller et al. (1995) used a social accounting matrix (SAM) to examine the effects of increased timber production on the distribution of income in McCurtain County, Oklahoma. Effects transmitted through timber ownership were shown to have no effect on household income while increased wood processing was shown to positively contribute to income levels for poorer households. Binkley et al. (1994) assessed the impact of reduced forests harvest levels in British Columbia on the provincial economy with a Computable General Equilibrium (CGE) model. In assessing the impact, they argued that many communities in the province had few alternative development options.

No studies to date have examined the contribution of value-added forests products industries, such as furniture manufacturers, to regional economic development. Rather, previous research concerning the economic contribution of these industries has centered on either product marketing channels (Meyer et al 1992; Chance and Vlosky 1996; Vlosky, Chance, and Doucet 1996; and Vlosky et al. 1997) or on comparing direct value-added by industry components (Ireland and Maxcy 1991). A few economic impact studies, such as Aruna et al. (1997), have examined the contribution of wood products industry to regional economic activity, but only at a very aggregated level. Further, these studies have not examined the impact of the value-added forests products industry on income distribution in a particular economy or set of economies.

This research is designed to fill a gap in the literature, by providing an assessment of the value-added forests product industry's contribution to total economic activity in a regional economy. The research is also intended to provide an examination of how feasible growth in the industry would influence the distribution of regional income between different types of households.

Data and Methods

Interindustry models are a well established procedure for examining the effects of the development of a particular industry on a regional economy. This set of models include the more traditional input-output (I-O) model, the social accounting matrix (SAM) (Adelman and Robinson 1986), and the price flexible Computable General Equilibrium (CGE) model (Berck et al., 1990). In the SAM, the I-O framework is extended by explicitly modeling relationships involving nonmarket income flows, such as government transfer payments to households. In a regional SAM, the flow of income from industries in the region to regional households as providers of factors of production is also explicitly outlined (Holland and

Wyeth 1993). Historically, SAMs have been constructed along either income class or functional lines to allow for examining changes in income distribution under various scenarios.

The model used in this study is a SAM of the ten parish (county) region in northwestern Louisiana. The ten contiguous parishes included in the study are listed as follows: Bienville, Bossier, Caddo, Clairborne, De Soto, Lincoln, Natchitoches, Red River, Sabine, and Webster. The SAM was generated based on the IMPLAN (IMpact PLANning) regional model construction software (Minnesota IMPLAN Group, Inc. 1996). IMPLAN can be used to create so-called ready made economic models (originally I-O and more recently SAM) of regional economies.

Adapting ready-made models to a variety of uses has given rise to a group of models known as hybrids. Hybrid models are I-O or SAM models that have been constructed for a specific purpose or economy by adapting a ready made model. Such adaptations are the result of efforts on the part of users to validate the model for a specific locale or use. Many different procedures are employed in the validation process ranging from the use of secondary and primary data sources to statistical procedures. The significance of these validation processes is particularly sensitive to the level of sector aggregation employed in the model and the economic structure of the economy being modeled. These factors are particularly important to those concerned with substate or rural economies, since all of the ready made modeling systems draw on nationally developed coefficients in some manner.

The SAM used in this study was a hybrid model that was based on the original ready-made (IMPLAN) SAM for the ten parish region in northwestern Louisiana. The original SAM was modified in several respects to generate the hybrid SAM used in this study.

In IMPLAN, the production and consumption of up to 528 industries in an economy can be accounted for. According to the IMPLAN database, 290 industries existed in the ten parish regional economy in 1993. It is common practice in regional economic model construction to aggregate (group) individual industries into aggregate industries based on the economy under study and the goals of the research. Hence, a modification to the original IMPLAN SAM was the aggregation of industries in the model into seventeen aggregate industries.

According to the IMPLAN database, value-added forests products industries at the four digit Standard Industrial Classification (SIC) Code level that were shown to exist in the region included Millwork (SIC 2431), Wood kitchen cabinets (SIC 2434), Structural wood members (SIC 2439), Wood pallets and skids (2448), Wood preserving (SIC 2491), Wood products n.e.c. (SIC 2499), Wood household and upholstered household furniture (SIC 2511, SIC 2512), Wood Television and radio cabinets (SIC 2517), Public building and related furniture (SIC 2531), and Wood partitions and fixtures (SIC 2541).

Because production levels in the region were at modest levels, the eleven industries were aggregated (grouped) into five industries that were used to represent the value-added wood products industry in northwestern Louisiana. The five sectors were Kitchen Cabinets

and Millwork (IMPLAN sector 137), Structural Wood Members (including wood pallets and skids) (140), Wood Preserving (including wood products n.e.c.) (145), Furniture (wood household, upholstered household, and public building furniture and wood television and radio cabinets) (148), and Wood Partitions (157). Twelve other sectors were used to represent the rest of the regional economy. Nine of the twelve industries were formed from 276 of the remaining 279 producing sectors in the original IMPLAN model of the regional economy. Because of expected strong backward linkages from the value-added forest products industries, three industries, Logging (133), Sawmills (134), and Veneer and Plywood (139) were kept as individual industries.

Another set of changes in the model concerned regional Purchase Coefficients (RPCs), which are estimates of use by regional industries of regional production of a given commodity (Minnesota IMPLAN Group, Inc., 1997). For example, a RPC of 0.8 for logging indicates that 80 percent of all logs produced in the regions would be purchased by firms located in the region. Estimating RPCs is important, because RPC levels influence estimates of regional economic multipliers and economic impact analysis. For example, all else equal, a RPC of 0.10 for logging would result in lower estimates of regional multipliers and economic impacts for a particular scenario than would a RPC of 0.90 for logging.

RPC coefficients for thirty-four commodities in the original SAM model were modified to improve the accuracy of model estimates (Table H1). For twenty-four commodities, RPCs were changed based on knowledge of the regional economy and on economic theory. For example, the RPC for ready-mixed Concrete (IMPLAN commodity 244) was increased from .0062 to 1.0, because location theory indicates that such a bulk item is prohibitively expensive to ship long distances and hence the commodity would serve local markets (1). RPCs for ten wood products industries were changed based on survey data provided in another part of this report. Primary wood products and value-added woods products firms in the region were separately asked about the geographical distribution of their sales (in Louisiana, out of Louisiana, and out of the United States). Their responses provided an upper bound on the regional RPC for the commodities in question. For example, if a firm ships sixty percent of its production out of state then the upper bound on the regional RPC for the commodity would be forty percent.

Table 1. Modified Regional Purchase Coefficients in the Social Accounting Matrix (SAM) of the Northwestern Louisiana Economy in 1993.

Commodity Code and Name	New RPC	Original RPC	Difference
1 Dairy Farm Products	0.7000	0.0409	0.6591
2 Poultry and Eggs	0.9000	0.9827	-0.0827
10 Cotton	1.0000	0.1024	0.8976
13 Hay and Pasture	1.0000	0.0696	0.9304

23	Greenhouse and Nursery Products	0.3174	0.1001	0.2173
60	Poultry Processing	0.1000	0.9503	-0.8503
95	Bottled and Canned Soft Drinks and Water	0.8250	0.0193	0.8057
101	Manufactured Ice	1.0000	0.8263	0.1737
134	Sawmills and Planing Mills, General	0.1433	0.7839	-0.6406
138	Wood Kitchen Cabinets	0.3297	0.5337	-0.2040
139	Veneer and Plywood	0.1433	0.8603	-0.7170
140	Structural Wood Members, N.E.C.	0.3297	0.8016	-0.4719
142	Wood Pallets and Skids	0.3297	0.8106	-0.4809
145	Wood Preserving	0.3297	0.9498	-0.6201
146	Reconstituted Wood Products	0.1433	0.8114	-0.6681
147	Wood Products, N.E.C.	0.3297	0.4067	-0.0770
148	Wood Household Furniture	0.3297	0.4622	-0.1325
157	Wood Partitions and Fixtures	0.3297	0.8174	-0.4877
162	Paper Mills	0.0300	0.0030	0.0270
163	Paperboard Mills	0.0500	0.0054	0.0446
164	Paperboard Containers and Boxes	0.2000	0.9921	-0.7921
174	Newspapers	0.6000	0.1870	0.4130
179	Commercial Printing	0.5000	0.1728	0.3272
195	Drugs	0.2000	0.6269	-0.4269
243	Concrete Products, N.E.C.	0.2500	0.0159	0.2341
244	Ready-Mixed Concrete	1.0000	0.0062	0.9938
284	Fabricated Plate Work	0.2000	0.0363	0.1637
433	Railroads and Related Services	1.0000	0.5594	0.4406
460	Insurance Agents and Brokers	0.9000	0.5223	0.3777
461	Owner-Occupied Dwellings	1.0000	0.7000	0.3000
463	Hotels and Lodging Places	0.3000	0.6619	-0.3619
494	Legal Services	0.7000	0.7764	-0.0764
504	Labor and Civic Organizations	0.8000	0.5996	0.2004
513	U.S. Postal Service	1.0000	0.5112	0.4888

Based on this information, the RPCs for three primary woods products industries (Sawmills (commodity 134), Veneer and Plywood (139), and Reconstituted Woods Products (146)) were all changed from larger values to 0.1433. The RPCs for seven value-added forests products commodities (Wood Kitchen Cabinets (138), Structural Wood Members (140), Wood Pallets and Skids (142), Wood Preserving (145), Wood Products N.E.C. (147), Wood Household Furniture (148), and Wood Partitions and Fixtures (157)) were all changed from larger values to 0.3297.

Another important change that was made to the original IMPLAN SAM for the regional economy concerned the way in which earnings are accounted for. Earnings are payments to labor (employee compensation in IMPLAN) and payments to owner-operators (proprietors income in IMPLAN, which are a mixture of returns to capital and labor). In the original IMPLAN SAM, In terms of consumption of regional income and aggregate nonmarket income flows, households are divided into three income groups as follows: low income households, receiving up to \$20,000 in annual income; medium income households, receiving between \$20,000 and \$40,000 in annual income, and high income households, receiving at least \$40,000 in annual income. However, for employee compensation and proprietors income, payments to each type of household are placed in a common income pool (i.e., payments to labor and returns to proprietors at the industry level form a single row). Total payments are then allocated to low medium, and high income households based on fixed income shares.

Any change in earnings by a particular industry is treated as a typical or regional average change in income across the three income groups. For example, assume that earnings payments to the three household income groups across all industries in the region were \$2 billion to low income households, \$7 billion to medium income households, and \$1 billion to high income households. Then an increase in earnings payments by regional industries to regional households of \$100 million would be allocated as \$20 million to low income households, \$70 million to medium income households, and \$10 million to high income households. But the distribution of earnings between income levels can vary markedly among different regional industries. For example, assume that an industry had no payments to low income households, \$10 million in payments to medium income households, and \$90 million in payments to high income households. In this case, the average distribution of earnings between households (20 percent to low income, 70 percent to medium income, and 10 percent to high income households) would provide an inaccurate representation of the effects on growth by that industry on the regional economy. The results would be driven by the so-called brain dead SAM, where effects of industry and policy change in the distribution of income can not be estimated (Alward and Lindall; Lindall et al.) and overall economic impacts may even be misrepresented.

Because a major issue of this research was the impact of industry growth in income distribution, it necessary to eliminate the brain dead SAM problem, which was done by incorporating results from an industry occupation matrix of the regional economy into the hybrid SAM. The result of this process was a hybrid SAM of the ten parish region that contained estimates of earnings payments by regional industries to each of the three regional household income groups (low, medium, and high income households).

To build the industry occupation matrix, a occupational breakdown of workers in the region was obtained based on data found in the Louisiana Occupational Employment Statistics for 1993 (Louisiana Dept. of Labor, Research and Statistics Unit 1994). The report gave the occupational breakdown of employment in the state and separately for all metropolitan parishes in Louisiana by nine major occupational categories listed as follows: executive,

administrative, and managerial; professional speciality; technicians and related support; marketing and sales; administrative support, including clerical; service; agriculture, forestry, fishing, and related; precision production, craft, and repair; and operators, fabricators, and laborers. For the three metropolitan parishes in the region (Bossier, Caddo, and Webster), the distribution of occupations was obtained directly from this published data (2).

To estimate the occupational distribution for the seven remaining nonmetropolitan parishes in the region, values for each of the nine occupational categories for all metropolitan parishes in Louisiana were summed. The resulting totals were then subtracted from the reported values for Louisiana for each occupational category to calculate the distribution of occupations in all nonmetropolitan parishes in Louisiana. Consistent with total employment estimates, this distribution was assumed to hold for the seven nonmetropolitan parishes in the study region.

The next step was to estimate the distribution of the nine occupational categories across regional industries. The occupational totals for each of the nine categories was multiplied through (as a vector) the occupational industry matrix for the U.S. for 1993. The resulting matrix was then monetarized, using national earnings estimates for each of the nine occupational categories. The resulting matrix was then RASed, to force consistency with IMPLAN estimates of earnings in the region by industry.(3) The matrix was then aggregated into seventeen sectors for consistency with the regional SAM. For each industry, the nine occupations were assigned to one of the three household income categories, based on average earnings per worker in the category. The result was the estimate of earnings for each of the three household income groups (low, medium, and high income) by industry category as provided in Table2.

The hybrid SAM model depicted in Table 2 provides a picture of economic flows in the region in 1993. The SAM contains several major sections. The interindustry portion of the SAM shows the value of product flows between the industries in the regional economy. Also included as column accounts are purchases by other parts of the regional economy, such as households and government of regional product. The value-added portion of the SAM shows payments to regional factors of production by regional industries plus Indirect Business Taxes (taxes imbedded in prices, such as sales taxes). This part of the table also forms an estimate of gross regional product. Institutional accounts describe the accumulation and distribution of various forms of earned and unearned income.

A SAM expenditure matrix (S) can be formed by column normalizing the SAM matrix. This process involves model closure an important issue in SAM analysis. Closure is the determination of which accounts should be endogenous or driven by spending in the regional economy. Mathematically, closure means determining which accounts belong in a matrix inverse. If all accounts were included in the inverse, the matrix is singular and hence has an infinite number of solutions. The decision was made to close the model with respect to households following Holland and Wyeth and the normal closure rule for I-O models. Hence, the S matrix is the portion of the SAM model that is held to be endogenous (including their interindustry portion of the table, value-added payments to households, and payments to other property income). Values in the appropriate rows across each columns relating to these parts of the SAM were column normalized to form the coefficients in the S matrix. The S matrix was then used to calculate the (I-S) inverse matrix, which is analogous to the Leontief Inverse in I-O models. Each of the columns in the (I-S) inverse matrix contain coefficients showing the changes in activity in the appropriate row industry or sector, as result of a one dollar change in final demand by the industry represented by that column. By summing the columns, the SAM (I-S) inverse can be used to generate economic multipliers and impact analysis for industries in the regional economy.

Results

Wood Product Industry Sector Multipliers

Economic multipliers for the seventeen industry sectors in the SAM model of the northwest Louisiana economy are provided in Table 3. Output multipliers show the change in total product across all industries in the regional economy for a one dollar change in sales by the industry in question. Output multipliers of particular interest for this study include the \$1.9592 change in total regional output for a \$1.00 change in sales by Kitchen Cabinets and Millwork (137), the output multiplier of \$2.1787 for Structural Wood Members (140), the output multiplier of \$2.1717 for Wood Preserving (145), the output multiplier of \$1.8688 for Furniture (148), and the output multiplier of \$1.8962 for Wood Partitions (157). Output multipliers for three of the five value-added forests products industries were among the top five industrial sectors in terms of output multipliers.

Table 3. Economic Multipliers for All Industries in the Social Accounting Model (SAM) of the Northwest Louisiana Economy in 1993.

		Output Multiplier	Total Income Multiplier	Income Multiplier by Household		
				Low	Medium	High
1	Agriculture	1.7026	0.5451	0.3182	0.1963	0.0307
28	Mining	1.6977	0.5613	0.0816	0.2731	0.2067
48	Construction	1.8271	0.6607	0.1344	0.4785	0.0478
58	Other Manufacture	1.7023	0.5055	0.0786	0.3832	0.0437
133	Logging	1.7772	0.4700	0.1223	0.3245	0.0233
134	Sawmills	2.2681	0.6622	0.1050	0.4876	0.0695
137	Kitchen Cabinets, Millwork	1.9592	0.7679	0.2331	0.5015	0.0333
139	Veneer and Plywood	2.1352	0.6861	0.0975	0.4918	0.0967
140	Structural Wood Members	2.1787	0.7982	0.1869	0.5373	0.0740
145	Wood Preserving	2.1717	0.5788	0.1057	0.4110	0.0621
148	Furniture	1.8688	0.6640	0.2335	0.3737	0.0569
157	Wood Partitions	1.8962	0.7798	0.2155	0.5141	0.0502
433	Transport and Utilities	1.8175	0.6910	0.0873	0.4660	0.1376
447	Trade	1.7362	0.8500	0.2934	0.5327	0.0238
456	Finance and Insurance	1.6714	0.4957	0.1521	0.3054	0.0382
463	Services	1.8981	0.9290	0.2522	0.6496	0.0271
510	Government	1.8933	1.3072	0.1236	1.1596	0.0240

Note: All multipliers based on \$1.00 change in output by the industry.

Also provided in Table 3 are the income multipliers that show the effect of increases in one dollar of industry output on total household income and on each of the three household income levels (low, medium, and high income households). Total income multipliers for the five value-added forest products industries ranged from \$0.7982 for Structural Wood Members (140) (ranked fourth among the seventeen industries) to \$0.5788 for Wood Preserving (145) (ranked twelfth).

For four of the five value-added forests products industries, multipliers for low income household were larger than average (Table 3). This results implies that growth in the five industries may be especially beneficial to low income households. Among the five sectors,

Kitchen Cabinets (137) at \$0.2331, Structural Wood Members (140) at \$0.1869, Furniture (148) at \$0.2335, and Wood Partitions (157) at \$0.2155 had larger than average increases for low income level households.

Impact Analysis

Impact analysis is used to determine either the effect of a particular policy change in regional economic activity or the contribution of growth or decline in a given industry or set of industries on regional economic activity. In this study, growth in the five sectors forming the value-added forests products sectors (Kitchen Cabinets and Millwork (137), Structural Wood Members (140), Wood Preserving (145), Furniture (148), and Wood Partitions (157) formed the impact analysis scenarios. Impact analysis was performed for three regional value-added forests products industry growth scenarios: a 100 percent increase in output, a 50 percent increase in output, and a 25 percent increase in output (4).

Wood Products Industry Growth: 100 Percent Increase

Total sales by the five industries were estimated to equal \$95.907 million in 1993. Hence, a 100 percent increase in output by the four industries lead to a direct impact scenario of that level. The 100 percent increase in industry output was projected to lead to a \$202.650 million increase in economic activity in the regional economy (an increase in total output in the 1993 regional economy of 1.1 percent) and 2,264 new jobs created. Hence, such a level of growth in value-added forests products industries would provide a fairly substantial increase in overall regional economic activity.

Of the total \$202.650 million increase in output, \$106.743 million (52.7 percent) occurred in sectors either indirectly affected through industry linkages (indirect effects) or affected by household spending that was supported by the value-added woods product industry (induced effects). Indirect effects were concentrated in the Logging (133) sector at \$11.188 million and in the Sawmill (134) sector (\$10.699 million) (Table 4). The induced affect due to household spending had its strongest influence on output in the Trade (447) (\$12.850 million) Finance and Insurance (456) (\$11.298 million), and Services (463) (\$22.992 million) sectors.

Table 4. Economic Impact of 100 Percent Increase in Production Levels by Regional Value-Added Forest Products Industry on Northwest Louisiana Economy in 1993.

		Output	Total Income	Income by Household Income Class			Gross State Product	Employment
				Low	Medium	High		
1	Agriculture	2.128	1.160	0.677	0.418	0.065	0.950	43.8
28	Mining	1.043	0.585	0.085	0.285	0.215	0.639	4.1
48	Construction	5.918	3.910	0.796	2.832	0.283	2.514	60.7
58	Other Manufacture	12.044	6.088	0.947	4.615	0.526	3.937	63.1
133	Logging	11.188	5.259	1.368	3.631	0.260	3.148	65.8
134	Sawmills	10.699	7.085	1.124	5.217	0.744	3.415	80.1
137	Kitchen Cabinets, Millwork	2.836	2.178	0.661	1.422	0.094	1.346	47.9
139	Veneer and Plywood	3.812	2.615	0.372	1.875	0.369	1.437	25.7
140	Structural Wood Members	13.531	10.800	2.529	7.270	1.002	5.526	186.3
145	Wood Preserving	62.944	36.435	6.654	25.872	3.909	13.381	327.1
148	Furniture	13.295	8.829	3.104	4.968	0.756	5.078	175.8
157	Wood Partitions	3.945	3.076	0.850	2.028	0.198	1.874	62.6
433	Transport and Utilities	10.254	7.085	0.895	4.779	1.411	5.692	79.0
447	Trade	12.850	10.922	3.771	6.845	0.306	10.119	390.3
456	Finance and Insurance	11.298	5.601	1.719	3.451	0.431	6.980	74.2
463	Services	22.992	21.360	5.800	14.937	0.624	14.539	514.5
510	Government	1.875	2.450	0.232	2.174	0.045	1.780	61.7
	Total	202.650	135.438	31.583	92.617	11.239	82.355	2262.7

Note: All monetary values are in millions of dollars. Estimates are based on SAM model of the regional economy.

Total employment in the region was projected to increase by 2,263 jobs under this growth scenario or an increase from an employment base of 265,208 jobs of 0.9 percent. Of the 2,263 jobs, 799 jobs (35.3 percent) were generated in the value-added forests products industries with the largest such job impact occurring in Wood Preserving (145) at 327 jobs (Table 3). The remaining 1,464 jobs created in the rest of the regional economy were concentrated in the Services (514 jobs) and Trade (390 jobs) sectors. On average, one job in the value-added wood products set of industries lead to 1.83 jobs in the rest of the regional economy.

Total household income was projected to increase by \$135.439 million with \$31.583 (23.3 percent) of this total going to low income households, \$92.617 (68.4 percent) going to middle income households, and \$11.239 (8.3 percent) going to high income households (Table 3). Of the \$135.439 million, \$61.318 (45.3 percent) went to workers directly employed by value-added forests products industries. In examining the distribution of the \$61.318 million increase in household income among directly affected workers, \$13.799 (22.5 percent) million went to low income households, \$41.560 (67.8 percent) went to medium income households, and \$5.959 million went to high income households.

Increases in gross regional product were projected to equal \$82.355 million or a growth of 0.8 percent over 1993 levels (Table 4). Of the \$82.355 million increase in gross regional product, \$27.205 million (33.0%) occurred directly in the five value-added forests products industries. Directly effected sectors with larger changes in their contribution to gross regional product included Wood Preserving (145) at \$13.381 million, Structural Wood Members (140) at \$5.526 million, and Furniture (148) at \$5.078 million. Sectors with larger than average indirect impacts included Trade (447) with \$10.119 million in regional gross product and Services (463) with \$14.539 million in regional gross product.

Wood Products Industry Growth: 50 Percent Increase

Impact analysis was also done for a 50 percent increase in output for the five value-added forests products industries. As indicated in Table 5, the direct change in output in the five industries was \$47.954 million while the total change in output in the regional economy was \$101.325 million or a projected gain of 0.5 percent in output over current levels for the entire regional economy. Increases in total regional employment were projected to be 1,131 jobs or an increase in total employment in the region of 0.4 percent over 1993 employment levels. The increase in gross regional product over 1993 levels was projected to be \$41.178 million or an increase of 0.4 percent.

Table 5. Economic Impact of 50 Percent Increase in Production Levels by Regional Value-Added Forest Products Industry on Northwest Louisiana Economy in 1993.

		Output	Total Income	Income by Household Income Class			Gross State Product	Employment
				Low	Medium	High		
1	Agriculture	1.064	0.580	0.338	0.209	0.033	0.475	21.9
28	Mining	0.521	0.293	0.043	0.142	0.108	0.320	2.1
48	Construction	2.959	1.955	0.398	1.416	0.141	1.257	30.4
58	Other Manufacture	6.022	3.044	0.474	2.308	0.263	1.969	31.6
133	Logging	5.594	2.630	0.684	1.815	0.130	1.574	32.9
134	Sawmills	5.350	3.543	0.562	2.609	0.372	1.707	40.0
137	Kitchen Cabinets, Millwork	1.418	1.089	0.330	0.711	0.047	0.673	24.0
139	Veneer and Plywood	1.906	1.307	0.186	0.937	0.184	0.718	12.8
140	Structural Wood Members	6.765	5.400	1.264	3.635	0.501	2.763	93.2
145	Wood Preserving	31.472	18.217	3.327	12.936	1.954	6.690	163.5
148	Furniture	6.648	4.414	1.552	2.484	0.378	2.539	87.9
157	Wood Partitions	1.972	1.538	0.425	1.014	0.099	0.937	31.3
433	Transport and Utilities	5.127	3.543	0.448	2.389	0.706	2.846	39.5
447	Trade	6.425	5.461	1.885	3.422	0.153	5.060	195.1
456	Finance and Insurance	5.649	2.800	0.859	1.725	0.216	3.490	37.1
463	Services	11.496	10.680	2.900	7.468	0.312	7.269	257.2
510	Government	0.937	1.225	0.116	1.087	0.022	0.890	30.9
	Total	101.325	67.719	15.791	46.308	5.619	41.178	1131.3

Note: All monetary values are in millions of dollars. Estimates are based on SAM model of the regional economy.

Wood Products Industry Growth: 25 Percent Increase

Finally, impact analysis was done for a 25 percent increase in output for the five value-added forests products set of industries. The direct change in output in the five industries was \$23.977 million while the total change in output in the regional economy was \$50.663 million or a projected gain of 0.3 percent in output over 1993 levels for the entire regional economy (Table 6). The increase in total regional employment was expected to be 566 jobs or an increase in total employment in the region of 0.2 percent over 1993 employment levels. The increase in gross regional product was projected to be \$20.589 million or an increase of 0.2 percent over 1993 levels.

Table 6. Economic Impact of 25 Percent Increase in Production Levels by Regional Value-Added Forest Products Industry on Northwest Louisiana Economy in 1993.

		Output	Total Income	Income by Household Income Class			Gross State Product	Employment
				Low	Medium	High		
1	Agriculture	0.532	0.290	0.169	0.104	0.016	0.238	11.0
28	Mining	0.261	0.146	0.021	0.071	0.054	0.160	1.0
48	Construction	1.479	0.978	0.199	0.708	0.071	0.629	15.2
58	Other Manufacture	3.011	1.522	0.237	1.154	0.131	0.984	15.8
133	Logging	2.797	1.315	0.342	0.908	0.065	0.787	16.4
134	Sawmills	2.675	1.771	0.281	1.304	0.186	0.854	20.0
137	Kitchen Cabinets, Millwork	0.709	0.544	0.165	0.356	0.024	0.336	12.0
139	Veneer and Plywood	0.953	0.654	0.093	0.469	0.092	0.359	6.4
140	Structural Wood Members	3.383	2.700	0.632	1.817	0.250	1.382	46.6
145	Wood Preserving	15.736	9.109	1.664	6.468	0.977	3.345	81.8
148	Furniture	3.324	2.207	0.776	1.242	0.189	1.270	44.0
157	Wood Partitions	0.986	0.769	0.213	0.507	0.050	0.469	15.6
433	Transport and Utilities	2.564	1.771	0.224	1.195	0.353	1.423	19.7
447	Trade	3.212	2.730	0.943	1.711	0.077	2.530	97.6
456	Finance and Insurance	2.824	1.400	0.430	0.863	0.108	1.745	18.6
463	Services	5.748	5.340	1.450	3.734	0.156	3.635	128.6
510	Government	0.469	0.613	0.058	0.543	0.011	0.445	15.4
	Total	50.663	33.860	7.896	23.154	2.810	20.589	565.7

Note: All monetary values are in millions of dollars. Estimates are based on SAM model of the regional economy.

Wood Products Industry Growth vs. General Economic Growth

One additional impact scenario was done to provide a comparison between changes in income distribution under growth in the value-added forests products industries versus general growth in the regional economy. To estimate the impact of general growth, the effect on household incomes of a proportional increase in final demand for all sectors totaling \$95.907 million (the same direct increase in output as for the 100 percent value-added forests products growth scenario) was examined. The general growth impact scenario resulted in an increase in regional output of \$171.515 million, an increase in regional employment of 2,537 jobs, and an increase in gross regional product of \$97.112 million. Total household income was predicted to increase by \$124.417 million or \$11.022 million less than under the 100 percent value-added forests products growth scenario.

Of the \$124.417 projected increase in household income under the general growth scenario, \$27.884 million (22.4 percent) was expected to go to low income households, \$88.010 million (70.7 percent) was expected to go to medium income households, and \$8.523 million (6.8 percent) was expected to go to high income households. For each household income level, increases in income were projected to be less than those projected under the 100 percent value-added forests products growth scenario.

A comparison of results under the general growth impact scenario to the 100 percent value-added forests products growth scenario provided mixed evidence concerning the contribution of the value-added forests products sector to income equality in the regional economy. As shown in Table 7, increases in income for low income households was greater in absolute (\$31.583 million versus \$27.884 or 13.3 percent higher) and in relative terms (23.3 percent versus 22.4 percent of the total increase in household income) for the 100 percent growth in value-added forests products scenario versus the general growth scenario. But on the hand, the 100 percent growth in value-added forests products scenario resulted in a larger increase in income going to high income households in absolute (\$11.239 million versus \$8.523 million or 31.9 percent higher) and relative terms (8.3 percent versus 6.8 percent of the total increase in household income).

Hence, growth in value-added forests products would have increased income inequality in the regional economy, by increasing the share going to high income households. But on the other hand, it was expected to reduce income inequalities by increasing the share of income going to low income households. If the policy goal is to create economic opportunities for low income households, then model results imply that efforts aimed at the development of the value-added forests products industry would be more effective than efforts aimed at facilitating general economic growth.

Table 7. Distribution of Households Spending Impacts in Northwest Louisiana Economy in 1993 Due to 100 Percent Increase in Production Levels by Regional Value-added Forest Products Industry Versus General Increase in Economic Activity.

	Low Income Households	Medium Income Households	High Income Households	Total Household Income
100 Percent Value-added Forests Products Growth				
Absolute (millions of \$)	31.583	92.617	11.239	135.438
Percentage	(23.3)	(68.4)	(8.3)	(100.0)
General Growth				
Absolute (millions of \$)	\$27.884	88.010	8.523	124.417
Percentage	(22.4)	(70.7)	(6.8)	(100.0)

Note: Increase in direct sales under both scenarios equaled \$95.907 million. General economic growth total distributed between regional industries based on distribution of final demand in the regional SAM.

Summary and Conclusions

Because of plentiful input supplies and access to output markets, interest in the potential of the value-added forest products industry has been increasing as a means of facilitating economic development. The value-added forests products industry has the potential for supporting economic growth in rural areas of Louisiana.

Results from a SAM model of ten parishes in northwestern Louisiana indicate that growth in the sector would make a fairly substantial contribution to overall economic activity in the region. Results from the SAM also indicate that development of the industry may be an appropriate way to create economic opportunities for lower income households.

ENDNOTES:

(1) RPCs are discussed in commodity rather than industry terms. The distinction is made between commodities and industries because an industry can produce multiple outputs (commodities). Firms are classified based on their primary (largest dollar value) industry. In an industry by industry SAM, as used here, matrix multiplication is used to include information about the relationship between industries and commodities in the appropriate model coefficients.

(2) Parishes (counties) are designated as nonmetropolitan versus metropolitan based on Census population and commuting data.

(3) The RAS was originally developed to allow researchers to update input-output tables for new aggregate observations concerning regional output (Miller and Blair 1985). In the procedure, values in a matrix are adjusted to be consistent with new row and column totals.

(4) Impact analysis for each of the three growth scenarios was also done separately for each of the five value-added forests products sectors. Results from this set of analysis are provided in Appendix Tables 1 through 15.

References

- Adelman, I. And S. Robison. 1986. "U.S. Agriculture in a General Equilibrium Framework: Analysis with a Social Accounting Matrix." *American J. Of Agricultural Economics*, 68(4): 1196-1207.
- Alward, G. And S. Lindall. August, 1996. Derving SAM Multiplier Models Using IMPLAN. Paper Presented at Micro IMPLAN Users Conference, Minneapolis, MN.
- Anderson, H.M. and J.T. Olson. 1991. "Fderal Forests and the Economic Base of the Pacific Northwest." *The Wilderness Soc.*, Washington, D.C.
- Aruna, P.B., Federick Cabbage, Karen J. Lee, and Clair Redmond. 1997. "Regional Economic Contribution of the Forest-Based Industries in the South." *Forest Products Journal*. 47(7-8): 35-45.
- Beuter, J.H. 1990. "Social and Economic Impacts of the Spotted Owl Conservation Strategy." *Am. For. Resource Alliance*, Washington, D.C., Technical Bulletin 9003.
- Berck, P., S. Robinson and G. Goldman. July 1990. "The Use of Computable General Equilibrium Models to Assess Water Policies." *Wokring Paper No. 545*, Gianninni Foundation, University of Claifornia, Berkeley.
- Binkley, Clark S., Michael Percy, William A. Thompson, and Ilan B. Vertinsky. 1994. "A General Equilibrium of the Economic Impact of a Reduction in Harvest Levels in British Columbia." *The Forestry Chronicle*. 70(4): 449-454.
- Chance, N. Paul and Richard P. Vlosky. August 1996. "Wood Products Industry Structure in the Maco Ridge Economic Development Council Region." *Research Report*, Forest Products Marketing Program, Lousiana Forests Products Laboratory, Louisiana State University Agricultural Center. Baton Rouge.
- Holland D. And P. Wyeth. 1993. *SAM Multipliers: Their Decomposition, Interpretation and Relationship to Input-Output Multipliers*. Dept. Of Agricultural Economics. Washington State University, Pullman.
- Irland, Lloyd C. And Joel Maxcy. 1991. "Maine's Wood Industry: Value-Added Relationships, 1982-1987." *Forest Products Journal*. 41(9): 53-56.
- Lindall, S. G. Alward, B.J. Sullivan and A. Hussain. 1995. "A Social Accounting Matrix for Regional IO Systems." *Presented Paper*, Mid-Continent Regional Science Association Meetings, June 3-4.
- Louisiana Dept. of Labor, Research and Statistics Unit. 1994. *Louisiana Occupational Employment Statistics*. Baton Rouge.

Marcouiller, David W., Dean F. Schreiner, and David K. Lewis. 1995. "Distributive Economic Impacts of Intensive Timber Production." *Forest Science*. 41(1):122-139.

Meyer, Christopher J., Judd H. Michael, and Steven A. Sinclair. 1992. "The U.S. Wood Furniture Industry: a Profile of Products and Channels of Distribution." *Forest Products Journal*. 42(3): 65-70.

Minnesota IMPLAN Group, Inc. 1996. "IMPLAN Pro: User's Guide, Analytical Guide, and Data Guide." Minnesota IMPLAN Group, Inc., Stillwater, MN.

Sample, V. Alaric and Dennis C. Le Master. 1992. "Economic Effects of Northern Spotted Owl Protection." *Journal of Forestry*. 90(8):31-35.

Stevens, J.A. 1995. "Heterogeneous Labor Demand in the Western Washington Sawmill Industry." *Forest Science*. 41(1): 181-193.

Vlosky, Richard P., N. Paul Chance, and JoAnn Doucet. August 1996. "The Louisiana Solid Wood Products Industry." Research Report, Forest Products Marketing Program, Louisiana Forests Products Laboratory, Louisiana State University Agricultural Center. Baton Rouge.

Todaro, Michael P. 1995. *Economic Development*. 5th Ed., Longman, N.Y., N.Y.

Vlosky, Richard P., A. Nicola Koudou, N. Paul Chance, Marc McDill, and JoAnn Doucet. March 1997. "The Louisiana Solid Wood Products Industry: Resource Assessment, Industry Structure, and Value-Added Market Opportunities ." Research Report, Forest Products Marketing Program, Louisiana Forests Products Laboratory, Louisiana State University Agricultural Center. Baton Rouge.

Wear, D.N. and W.F. Hyde. 1992. "Distributive Issues in Forestry." *J. of Business Administration*. 20(1-2): 297-314.

**Evaluating the Social and Economic Factors Related to
Successful Labor Force Development for the Value-Added
Forest Products Industry in Northwestern Louisiana**

Pamela Monroe

Lydia Blalock

Social Structure and Work Readiness

Research has confirmed the importance of industry examining the social structure of a community where jobs may be created. The social structure of a community allows for an understanding of education constraints, social stratification, economy and the knowledge base that already exists in this community. The decision to locate an industry to a particular location may not be based as much on the quality of the labor pool but on the natural resources within the particular area. Often, when 'high tech' industries are introduced in a new location, the competence level of the residents is not adequate. In these instances, the industry is forced to look outside the immediate area and community for skilled workers during the early phases of development.

This component of the research methodology describes the pool of eligible workers for the proposed value-added forest products industry in the target area. Industries new to a region are concerned with the quality of the pool of potential workers. Employee quality is affected by the social conditions that exist in the surrounding area. This segment identifies the people in the study area, any uniqueness in the social structure or social institutions that exists and any potential problems with workers that could influence the success of the value-added forest products industry.

Specific objectives in the context of social structure are:

1. Determine social and economic profiles for the study region.
2. Describe the pool of eligible workers in the area, including possible success rates.
3. Identify labor skill needs of existing companies as well as labor skill needs of companies operating in the high value-added secondary forest products industry.
4. Assist local policy makers in formulating strategies for implementation of rural economic development efforts designed to capitalize on defensible market driven opportunities in forest products industry sectors.
5. Assist local policy makers in developing a methodology for measuring the success of the local implementation of the rural economic development strategies formulated in the project.
6. Assess the suitability of introducing value-added industries to economically depressed areas as adjuncts to welfare reform policies.

Introduction

The economic development plan proposed in the foregoing chapters risks becoming a house of cards without an examination of the communities and people who will directly affect the success or failure of the plan. Understanding the social and cultural aspects of the target communities helps move the proposed plan from an abstraction to reality, thus facilitating implementation. In the long run, this plan should be designed so that it is good for the industry *and* good for the communities and residents of the region. Little is gained for the people of this region if new industry is forced to look outside the immediate area and community for skilled workers.

In this chapter we will describe the pool of eligible workers for the value-added forest products industry in the target area. We will offer macro-level descriptions of the people in the region and any unique characteristics in the social structure that may challenge successful implementation of the plan. It is also important to identify any potential problems with the labor pool that could influence the success of a revitalization plan. Using a micro-level qualitative approach, we will describe the labor skill needs of existing companies in this industry.

The major idea that guided the development of this portion of the plan was the concept of *work readiness*. Most of the literature in this area is focused on education, training, skill development, and worker incentives (Cohan, 1990; Johnson & Provan, 1995; Johnson & Ray, 1993; Rieger, 1995; Wright, 1992). We took this concept and asked a different question: before a person ever enters the labor pool, what are the forces that shape that person's commitment and attitude towards work? Skills can be taught, but a willingness to work will determine whether or not the acquired skills will be used.

The backdrop for our examination of the labor pool in this region is the "welfare reform" plan currently being implemented in Louisiana and the nation. Because of the attention focused on welfare to work programs, we believe it is timely to investigate the suitability of introducing value-added industries to economically depressed areas as adjuncts to welfare reform policies. Women are the most common adult recipients of welfare, and many of them will be pushed into the labor force when their eligibility comes to an end. Jobs and workers are often scarce in rural areas, so we wanted to explore the suitability of employment in the forest products industry for (soon-to-be) former welfare recipients.

Methods of Investigation

Descriptive Statistics

Secondary data were collected and analyzed for appropriate indicators of parish socio-economic characteristics. Descriptive statistics gathered for each of the 10 parishes in the region included poverty rates, income levels, unemployment rates, and education levels. Where appropriate, means were calculated for the composite region. Data sources included the U.S. Bureau of the Census, the Current Population Survey, the Center for Business and Economic Research, the Louisiana State of the State Project, and previous research.

Employer Interviews

In order to answer questions pertaining to the skill needs of the secondary-wood products industry, it was necessary to interview managers or owners who currently employ individuals in their companies, or who are interested in expanding their business. We compiled a list of business owners who had participated in the earlier phase of this research. Then, with some input from an industry representative (Diane Simek, Administrator for the Coordinating and Development Corporation), we identified approximately 24 business owners in the northwest region. A letter was mailed to the employers outlining this portion of the project and notifying them of our plans to call and schedule appointments. Employers were then contacted by phone to schedule interviews at their place of business.

Eleven employers, from 6 of the 10 parishes in the region, agreed to be interviewed (see Table 1). Of the thirteen companies not interviewed, nine either could not be located or were out of business; three employers declined to be interviewed, saying that they had nothing to add to their previous comments to researchers; and one employer was not interviewed because we were unable to keep the appointment.

Table 1. Participating Employers

Company	Contact	Address	Type of Business
AAA Woodcraft	James Vaughan Owner	4108 Metro Drive Shreveport, LA 71109 (318) 636-5817 Caddo Parish	Pallets, stakes
Allen Millwork	B. J. Wheless Owner	6505 St. Vincent Shreveport, LA 71136 (318) 868-6541 Caddo Parish	Doors, Cabinets, etc.
B & C Wood Company	Edgar Cason Owner Reggie Manager	Rural Route 3, Box 228 Coushatta, LA 71019 (318) 935-6705 Red River Parish	Logs
Bolinger Millwork & Supply, Inc.	Coy Cooper Owner	2570 East Texas Street Bossier City, LA 71111 (318) 747-3000 Bossier Parish	Cabinets, doors assembly shop, building supplies
Cooper Chair Factory	James Cooper Owner	217 Pine Street Minden, LA 71055 (318) 377-4648 Webster Parish	Chairs, swings
Custom Components	Barbara Toliver Owner	PO Box 610 Ruston, LA 71273 (318) 255-1553 Lincoln Parish	Furniture, particle board, runners
Dura Oak Cabinets	Jeff Mills Owner	863 Texas Avenue Shreveport, LA 71101 (318) 227-9610 Caddo Parish	Cabinets
LaBorde's Custom Cabinets	Randall LaBorde Owner	1052 Pearl Drive Bossier City, LA 71111 (318) 747-0458 Bossier Parish	Cabinets
Sabine Wood Products	Ronny Broadway Owner	5340 Texas Highway Many, LA 71449 (318) 256-5951 Sabine Parish	Timber
Shreveport Pallet	Joyce Donaldson & Clint Fontenot Owner	1454 Hawn Shreveport, LA 71137 (318) 424-7218 Bossier Parish	Pallets
The Woodchuck	Patti Mitten Owner Mitch Mitten Manager	504 East Colorado Ruston, LA 71270 (318) 255-7927 Lincoln Parish	Reproduction architectural products

Employer Interview Questions

Personal interviews were conducted with the owners or managers of the participating secondary wood products manufacturing firms. All participants were assured of the confidentiality of their responses. Employers were asked fixed-response and open-ended questions (see Table 2). The interview format allowed us to explain and clarify questions and to expand upon issues of relatively greater importance. The employer interviews lasted about 45 minutes, ranging from about 15 minutes to about 3 hours.

Table 2. Employer Interview Questions

<i>Question</i>	<i>Probes</i>
1. Tell me a little bit about the workers you employ in your business.	What types of skills are required? What is the educational range? Describe your typical or average employee.
2. How difficult is it for you to fill your jobs here?	Are some spots easier to fill than others? If there are spots that are hard to fill, what do you think is the main problem with the applicants?
3. What do you look for in a potential employee?	What kind of skills? What does "work ready" mean to you, if I use that term to describe an applicant for one of your openings? Are your applicants, "work ready"? If not, what skills or behaviors are lacking?
4. Is substance abuse or violence obvious problems for your workers or applicants?	Will past problems in these areas keep you from hiring a person?
5. What kinds of rewards or incentives do your employees want the most?	Do you provide these? Are there others you would like to provide/like to stop providing?
6. Do you use immigrant or migrant labor at all?	How do you feel about having migrant workers in your workforce?
7. What incentives would encourage you, as an employer, to participate in a program designed to help people coming off public assistance to learn job skills and work readiness?	Would you give some close supervision or mentoring if it meant you might develop a good, trained employee? Would you provide incentives like on-the-job training, support for continuing education, flexibility, teaching basic workplace skills, help with family-related issues?
8. What are your plans for growth and development of your business?	Do you expect the available labor pool to meet those plans or will the available pool most likely fall short of your needs?
9. Do you have any other comments?	Is there anything that you think is important that we have failed to cover?

At the conclusion of four employer interviews, we asked if we could conduct focus groups with a handful of employees for 45 minutes to an hour, to ask them similar questions. No employer who was asked refused our request to conduct these focus groups. The

businesses selected for focus groups were diverse in their size and products (see Table 3).

Focus Groups

Focus group discussion is a useful method for gathering in-depth information from persons most closely acquainted with the issue being explored. It is more efficient than one-on-one interviews, and has the added advantage of stimulating a greater depth of thought as the group participants listen to one another. Focus groups were used for discussing work-related issues with employees of four of the businesses we visited. We targeted low- to mid-level skilled workers, assuming them to be most representative of the potential labor pool for this industry. We hoped to gain information that might influence recruitment and retention strategies for the industry, and reveal micro level impediments to labor force participation. We also wanted to probe for information on how to motivate and reward employee commitment to entry-level, minimum wage jobs.

Table 3. Focus Group Participants

<i>Company</i>	<i>Type of Business</i>	<i>Employees Included</i>
Allen Millwork	Doors, cabinets, etc.	4
Custom Components	Furniture particle board, runners	3
Dura Oak Cabinets	Cabinets	4
Shreveport Pallet	Pallets	4

Focus Group Questions

The focus groups were held on-site but without observation by the employer. Participants were asked fixed response and open-ended questions (see Table 4). The employee focus groups lasted from 45 minutes to an hour, and involved 3-4 workers each.

Table 4. Focus Group Questions

<i>Question</i>	<i>Probes</i>
1. Tell me a little about your educational background and work history?	How long have you worked here? What kind of work do you do?
2. Can a person do this kind of job without a high school education or the ability to read and write?	Is it important to know how to read & write? Would you hire somebody who could not read or write?
3. What kind of skills are required for the work that you do?	Are those skills you learned when you came to work here? Were there people here who helped you learn? What other kind of skills did you have when you came here?
4. Why do you come to work here? I know they pay you at end of the week, but what motivates you?	What makes this a good place to work?
5. Are there other benefits - incentives, insurance, retirement - that would be important to you?	
6. What makes you come to work every day to support your family?	Some people do not work to support their families. Why are you different? Why is this (work) what you have to do? Why won't some people work? What gives you that motivation?
7. Are drugs a problem on the job here?	Do they do drug testing?
8. In about a year a lot of people will be put off welfare. Have you ever worked with women, and how do you feel about working with women?	What would you have to get used to? We've been told women could do this job but you have to be tough.. What's a tough woman? What about her makes her able to the job?
9. Do you have anything else you want to tell me about working here, anything else that is important?	

Interviews with Non-employed Women

Eighty-four women in seven parishes participated in qualitative interviews at the sites where they were participating in GED classes or training programs. All of the women we interviewed were currently receiving welfare payments but face the termination of their eligibility for welfare program participation over the next 12-24 months.

Interview Questions for Non-employed Women

Participants were interviewed individually. Interview items included fixed response and open-ended questions (see Table 5.)

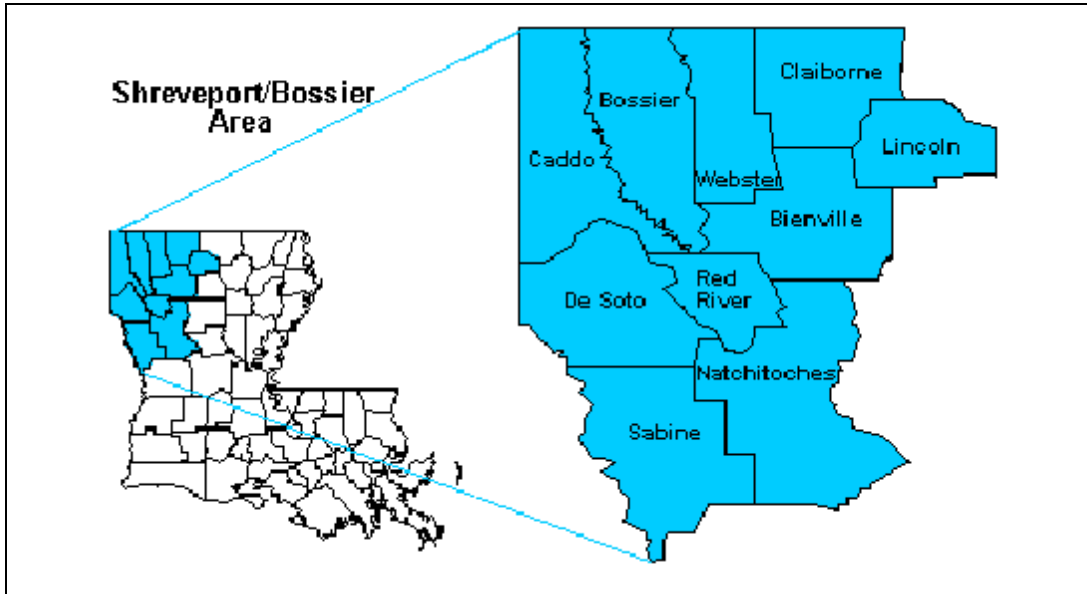
Table 5. Non-Employed Women Interview Questions

<i>Question</i>	<i>Probe</i>
1. Tell us your name and then - how many children you have and their ages.	
2. How many years of school did you finish?	Do you have a diploma, or a GED certificate?
3. Take a minute to think about the jobs you have held since you were 16 or so. Now, in general, describe the kind of paid work you've done.	Are you working anywhere for pay right now? Have you ever worked at a job that might be unusual for a woman - "man's work?" Would you do such work again? [Discuss forest industry.]
4. How long have you been divorced/split up? Was this your first divorce/end of relationship?	
5. A lot of times, more than one thing makes a couple split up. Go back to the time when you were thinking about getting a divorce/splitting up. Tell me the one or two most important reasons why you got divorced/split up?	Are there other main reasons you got divorced/split up?
6. How did your financial situation change after your divorce/relationship ended?	Now, has your financial situation gotten better or worse?
7. When you were getting your divorce/thinking about breaking up, how did you plan to support yourself and your children?	Did those plans actually work out?
8. Are you or your children getting any kind of help from the government? things like AFDC, food stamps, medicaid, or help with housing?	Describe.
9. When you were thinking about getting a divorce/ending your relationship did you ever think you might have to use public assistance?	
10. What advice would you give to other women with children - women like yourself - who might be thinking about getting divorced/splitting up?	
11. Is there anything else at all you would like to tell me about your divorce/relationship or your family situation since your divorce/break-up?	

Socio-economic Parish Profiles

The state of Louisiana is comprised of 64 parishes (counties). The region under consideration for this report is in the Northwest corner of the state, and is composed of 10 parishes (Figure 1). Following is description of each parish. See Table 6 for summary information.

Figure 1 Northwest Region



Bienville Parish



In 1990, Bienville's population of 15,979 ranked it as the second smallest parish in the Northwest Region, 52nd in the state. Bienville is not part of a standard metropolitan area. The residents of this parish are predominantly rural (81%), with 3% engaged in farm-based activity (U. S. Bureau of the Census, 1990b). In Bienville parish, the proportion of the population that is black (44%) is greater than the state average of 31% (U.S. Bureau of the Census, 1990c).

The parish had a 9.7% unemployment rate in 1995, higher than the state rate of 8.0%. Bienville had a per capita personal income of \$14,418 in 1995. This ranked 49th in the state, and was 75.9% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Forty-eight percent of the households in the parish have a total household income of less than \$15,000. Thirty-one percent of the residents live in poverty, including 40% of the children (U. S. Bureau of the Census, 1990a). The educational attainment

statistics for Bienville, then, are not surprising. Over one-third (37%) of the residents do not have a high school diploma or equivalent (U. S. Bureau of the Census, 1990b).

Bienville's largest industries in 1995 were durable goods manufacturing, nondurable goods manufacturing, and state and local government (Regional Economic Measurement Division, 1995). The largest private employers in Bienville parish included ConAgra Poultry Company (poultry processing-800 employees), Hunt Lumber Company (lumber-180 employees), Stone Container Corporation (high density bags-135 employees) and Willamette Industries (plywood sheeting-130 employees). The largest governmental employer is the Bienville Parish School System (439 employees) (Center for Business and Economic Research, 1995).

Bossier Parish



Bossier is part of the Shreveport-Bossier City Metropolitan Area. Its 1990 population of 86,088 ranked Bossier as the 2nd largest parish in the Northwest Region, 13th in Louisiana. Seventy-two percent of the residents of this parish live in urban areas. Of the remaining 28% located in rural areas of the parish, only 1% are engaged in farming (U. S. Bureau of the Census, 1990b). The racial mix for Bossier parish is largely white (78%), and includes the largest Hispanic population in the region with 2% (U.S. Bureau of the Census, 1990c).

In 1995 the parish had an unemployment rate of 6.6%, less than the state rate of 8.0%. That same year Bossier also had a per capita income of \$18,886. This ranked 12th in the State, and was 99.4% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Slightly more than one-third (35%) of the households in the parish have a total household income of \$25,000-\$50,000, with 28% of the households earning \$15,000 or less. Only 16% of Bossier residents live in poverty, but 22% of the children under 18 are living below the poverty level (U.S. Bureau of the Census, 1990a). The education level of the residents is higher than the state average, with 79% of the adult population holding a high school degree or equivalent (U.S. Bureau of the Census, 1990b).

The largest industries in 1995 were services, military, and state and local government (Regional Economic Measurement Division, 1995). The largest private employers in the parish included Horseshoe Entertainment (entertainment-2,200), Isle of Capri Casino (entertainment-1,800), and Louisiana Downs Racetrack (racing-900 seasonal employees). The major governmental employers were Bossier Parish School System (2,575), Barksdale Air Force Base (1,195 civilian), Bossier Medical Center (660), and City of Bossier (614).

Caddo Parish



Caddo parish is also part of the Shreveport-Bossier City Metropolitan Area. Its 1990 population of 248,253 ranked 4th in the State, and is by far the largest parish in the Northwest Region. Caddo is an overwhelmingly urban area; only 16% of the parish is rural, with virtually no farm activity (U. S. Bureau of the Census, 1990b). Racial composition includes a black population (40%) that is larger than the state average of 31% (U.S. Bureau of the Census, 1990c).

The 1995 unemployment rate of the parish was 6.0%, well below the state average of 8.0%. In 1995, Caddo had a per capita personal income \$21,420. This ranked 5th in the state, and was 112.8% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). One-third of the households in the parish had an income of \$25,000-\$50,000, but 36% of Caddo households reported income levels less than \$15,000. Approximately 25% of the residents live in poverty, and 34% of the children under 18 are poverty-stricken (U. S. Bureau of the Census, 1990a). Caddo parish residents boast a high school completion rate (73%) higher than the state average of 68% (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were services, state and local government, and durable goods manufacturing (Regional Economic Measurement Division, 1995). The largest private employers in Caddo included Schumpert Medical Center (medical-3,027), General Motors Corporation (trucks-2,700), AT&T Consumer Products (telephones-2,225), Willis-Knighton Medical Center (medical-2,000), and Libbey Glass (table glassware-1,000). The largest governmental employers included Caddo Parish School System (6,041), LSU Medical Center (4,895), City of Shreveport (3,047), and Overton Brooks VA Medical Center (1,077) (Center for Business and Economic Research, 1995).

Claiborne Parish



Claiborne is a small parish located on the Louisiana/Arkansas border. Its 1990 population of 17,405 ranked Claiborne as one of the smallest parishes in the region, 50th in the state. The majority (60%) of parish residents live in rural areas, with 2% of the population engaged in farm-related activities (U. S. Bureau of the Census, 1990b). Claiborne has the largest black population (46%) in the region, and the smallest Hispanic population (0.2%) (U.S. Bureau of the Census, 1990c).

The residents of Claiborne parish are among the poorest and least educated in the state. In 1995, the unemployment rate for the parish was 10.7%, the highest in the region. That same year Claiborne had a per capita personal income of \$14,617 (Regional Economic Measurement Division, 1995). This ranked 47th in the state, and was 76.9% of the state average of \$18,997. Almost one-half (48%) of the households reported income levels less than \$15,000. One-third (32%) of the residents live in poverty, including 40% of the children

under 18 (U. S. Bureau of the Census, 1990a). Thirty-nine percent of Claiborne parish adults do not have a high school diploma (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were state and local government, nondurable goods manufacturing, and services (Regional Economic Measurement Division, 1995). The largest private employers in Claiborne were Ansell Edmont Industrial (gloves-295) and Ludlow Corporation (packaging products-225). The largest governmental employer was Claiborne Parish School System (450), Wade Correctional Institution (382), and Homer Memorial Hospital (300) (Center for Business and Economic Research, 1995).

De Soto Parish



De Soto parish, located on the Louisiana/Texas border, had a 1990 population of 25,346, making it a mid-sized parish for the Northwest Region, 37th in the state. The parish is primarily rural, with only 21% of the population residing in urban areas. Two percent of the residents are engaged in farming (U. S. Bureau of the Census, 1990b). The racial breakdown for the parish is somewhat different than the state proportions, with a larger than average (44%) black population (U.S.

Bureau of the Census, 1990c).

In 1995, the De Soto parish unemployment rate was 7.7%, slightly lower than the state rate of 8.0%. That same year De Soto had a per capita personal income of \$17,829. This ranked 15th in the state, and was 93.9% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Almost one-half (47%) of De Soto parish household have incomes less than \$15,000. The parish has a total poverty rate of 30%, and 38% of children under 18 are below the poverty level (U. S. Bureau of the Census, 1990a). Over one-third of the adult residents of the parish do not have a high school degree or equivalent (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were construction, nondurable goods manufacturing; and state and local government (Regional Economic Measurement Division, 1995). The largest private employers in the parish included International Paper (linerboard-430) and Louisiana Pacific Corporation (plywood-356). The largest governmental employer was De Soto Parish School System (650) (Center for Business and Economic Research, 1995).

Lincoln Parish



In 1990, Lincoln's population of 41,745 ranked 26th in the state. It is a medium-sized parish in the Northwest Region. A majority (61%) of the residents live in urban areas, and only 1% of the population is farm-

based (U. S. Bureau of the Census, 1990b). The racial composition is similar to the other parishes in the region, 40% black and 59% white (U.S. Bureau of the Census, 1990c).

Lincoln parish had the lowest unemployment rate (1995) in the Northwest Region — 3.1% — much lower than the state average of 8.0%. In 1995, Lincoln had a per capita personal income of \$17,736. This ranked 16th in the state, and was 93.4 percent of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Twenty-eight percent of the households report incomes in the \$25,000 - \$49,999 range, but 42% have income levels less than \$15,000. Twenty-seven percent of parish residents are poverty-stricken, and 28% of the children under 18 live in poverty (U. S. Bureau of the Census, 1990a). Lincoln parish boasts the second highest high school completion rate (74%) in the Northwest Region (U. S. Bureau of the Census, 1990b).

The largest industries in the parish in 1995 were state and local government, services, and construction (Regional Economic Measurement Division, 1995). The largest private employers in Lincoln included Wal-Mart (retailer-670), Ball Incon Glass Packing (glass containers-450), and Willamette Industries (plywood-400). The largest governmental employers were Louisiana Tech University (1,150), Grambling State University (912), and Lincoln Parish School Board (805) (Center for Business and Economic Research, 1995).

Natchitoches Parish



Natchitoches is a medium-sized parish located in the southeast corner of the region. Its 1990 population of 36,689 ranked 30th in the state. A slight majority (55%) of the residents live in rural areas of the parish, with 2% engaged in farm-related activity (U. S. Bureau of the Census, 1990b). In Natchitoches parish, the proportion of the population that is black (38%) is greater than the state average of 31%. One percent of the population is Hispanic (U.S. Bureau of the Census, 1990c).

Natchitoches is one of the poorer parishes in the Northwest Region. The parish unemployment rate for 1995 was 8.2%, only slightly above the state average of 8.0%. In 1995, the parish had a per capita personal income of \$14,687 (Regional Economic Measurement Division, 1995). This ranked 46th in the state, and was 77.3% of the state average of \$18,997. Well over one-half of the households (61%) have income levels less than \$15,000. It is not surprising, then, that in Natchitoches parish 34% of its residents are below the poverty level. Almost half of the children under 18 (45%) live in poverty conditions, the highest proportion in the region (U. S. Bureau of the Census, 1990a). Education levels are also poor; over one-third (35%) of the adult population does not have a high school degree or equivalent (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were state and local government, services, and nondurable goods manufacturing (Regional Economic Measurement Division, 1995). The largest private employers in Natchitoches parish included ConAgra Poultry Company (food

manufacturing-1,110), Williamette Industries (kraft linerboard-375), and Trus-Joist MacMillan Corporation (laminated wood-195). The major governmental employers were Natchitoches Parish School System (1,065), Northwestern State University (634), and Natchitoches Parish Hospital (430) (Center for Business and Economic Research, 1995).

Red River Parish



Red River parish is the smallest parish in the Northwest Region. With a 1990 population of 9,387, Red River ranked 61st in the state. The racial proportions for the parish include a larger percentage of blacks (38%) than the state average of 31% (U.S. Bureau of the Census, 1990c). Red River parish is 100% rural, but only 2% of the population is farm-based (U. S. Bureau of the Census, 1990b).

Red River has one of the poorest populations in the regions. The 1995 unemployment rate was 12.5%, the highest in the Northwest Region. Also in 1995, Red River had a per capita personal income of \$15,092. This ranked 42nd in the state, and was 79.4% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Exactly 50% of the households reported income levels below \$15,000 per year. Red River has the highest total poverty level in the region (35%), with 44% of children under 18 living in poverty (U. S. Bureau of the Census, 1990a). As might be expected, Red River parish has the lowest high school completion rate in the region — only 57% of the adult residents have a high school diploma or equivalent (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were durable goods manufacturing; services, state and local government (Regional Economic Measurement Division, 1995). The largest private employers in Red River included Sunbeam Appliance Company (small appliances-440), Almond Brothers Lumber & Supply (lumber-110), and Hood Industries (lumber-97). The major governmental employer was Red River Parish School System (288) (Center for Business and Economic Research, 1995).

Sabine Parish



Sabine parish is located on the Texas/Louisiana border, in the southwest corner of the Northwest Region. Sabine's 1990 population of 22,696 makes it a mid-sized parish for the region., 38th in the state. The parish is largely rural (86%), and 2% of the population is engaged in farm-related activities (U. S. Bureau of the Census, 1990b). Sabine parish residents are primarily white (77%), and the parish has the largest Hispanic population (5%) in the Northwest Region (U.S. Bureau of the Census, 1990c).

The unemployment rate in 1995 was 8.3%, only slightly above the state rate of 8.0%. Sabine had a per capita personal income of \$15,470 in 1995. This ranked 37th in the state, and was 81.4% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Forty-five percent of the households report incomes of less than \$15,000 per year, and slightly more than one-quarter of the households report incomes in the \$25,000-\$50,000 range. Poverty levels in Sabine parish are higher than state averages, with 27% of Sabine's residents living in poverty, including 36% of children under 18 (U. S. Bureau of the Census, 1990a). Over one-third (38%) of the adult residents of Sabine do not have a high school diploma or equivalent (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were durable goods manufacturing, services, and state and local government (Regional Economic Measurement Division, 1995). The major private employers in Sabine parish included Boise Cascade Corporation (plywood/lumber-600), Willamette Industries (timber-300), and Holloway Sportswear (jackets-225). The largest governmental employer was Sabine Parish School (590) (Center for Business and Economic Research, 1995).

Webster Parish



In 1990, the population of Webster parish was 41,989, the 3rd largest parish in the Northwest Region, 27th in the state. Fifty-four percent of Webster's population resides in rural areas of the parish, but only 1% of the residents are farm-based (U. S. Bureau of the Census, 1990b). The black/white proportion of the population mirrors the state proportions (32%/68%), but the Hispanic population is negligible (U.S. Bureau of the Census, 1990c).

The unemployment rate for Webster in 1995 was 9.8%, higher than the state rate of 8.0%. In 1995, Webster had a per capita personal income of \$16,165. This ranked 27th in the state, and was 85.1% of the state average of \$18,997 (Regional Economic Measurement Division, 1995). Forty-two percent of Webster households have incomes less than \$15,000. One-quarter of the residents are below the poverty level, and one-third of the children are living in poverty (U. S. Bureau of the Census, 1990a). Thirty-six percent of parish adults do not have a high school degree or equivalent (U. S. Bureau of the Census, 1990b).

The largest industries in 1995 were durable goods manufacturing, services, and state and local government (Regional Economic Measurement Division, 1995). The largest employers in Webster included Fibrebond Corporation (portable buildings-550), International Paper (wood products-500), and Minden Medical Center (medical-220). The major governmental employer was Webster Parish School System (959) (Center for Business and Economic Research, 1995).

Table 6. Northwest Parishes Summary Data

Characteristic	Louisiana	Northwest Region	Bienville	Bossier	Caddo	Claiborne	De Soto	Lincoln	Natchitoches	Red River	Sabine	Webster
Total Population(1990)	4,206,116	545,527 (13% of state pop.)	15,979	86,088	248,253	17,405	25,346	41,745	36,689	9,387	22,646	41,989
Urban	2,860,159	349,419	3,079	61,829	207,541	7,006	5,389	25,511	16,609	0	3,126	19,329
% of total	68%	64%	19%	72%	84%	40%	21%	61%	45%	0%	14%	46%
Rural	1,345,957	196,108	12,900	24,259	40,712	10,399	19,957	16,234	20,080	9,387	19,520	22,660
% of total	32%	35%	81%	28%	16%	60%	79%	39%	55%	100%	86%	54%
Farm population	42,061	5,149	498	481	565	356	554	478	753	217	655	592
% of total	1%	1%	3%	1%	0.2%	2%	2%	1%	2%	2%	3%	1%
Gender (1990)												
Male	2,031,386	259,131	7,618	41,831	115,934	8,826	12,014	20,231	17,359	4,440	11,008	19,870
	48%	48%	48%	49%	47%	51%	47%	48%	47%	47%	49%	47%
Female	2,188,587	286,396	8,361	44,257	132,319	8,579	13,332	21,514	19,330	4,947	11,638	22,119
	52%	52%	52%	51%	53%	49%	53%	52%	53%	53%	51%	53%
Race (1990)												
White	2,839,138	345,130	8,986	67,030	146,580	9,313	14,003	24,620	22,357	5,752	17,939	28,550
	67%	63%	56%	78%	59%	54%	55%	59%	61%	61%	77%	68%
Black	1,229,281	194,242	6,949	17,381	99,511	8,041	11,141	16,590	13,779	3,589	3,984	13,277
	31%	36%	44%	20%	40%	46%	44%	40%	38%	38%	18%	32%
Hispanic	93,044	7,081	81	1,799	2,595	40	377	381	487	61	1,031	229
	2%	1%	0.5%	2%	1%	0.2%	1.5%	1%	1%	1%	5%	0.5%
Age (1990)												
Median	31 years	32 years	35 years	31 years	33 years	35 years	32 years	25 years	29 years	32 years	35 years	35 years
Under 18	1,227,269	156,014	4,513	25,184	70,899	4,446	7,550	9,594	10,976	2,925	6,454	13,473
	29%	28%	28%	29%	29%	26%	30%	23%	30%	31%	29%	27%
Labor Force (1995)												
Civilian	1,939,000	249,670	6,240	43,000	115,700	5,930	11,890	18,250	16,900	3,880	8,880	19,000
Unemployment rate	8.0%	8.3%	9.7%	6.6%	6.0%	10.7%	7.7%	3.1%	8.2%	12.5%	8.3%	9.8%

Northwest Parishes Summary Data (continued)

Characteristic	Louisiana	Northwest Region	Bienville	Bossier	Caddo	Claiborne	De Soto	Lincoln	Natchitoches	Red River	Sabine	Webster
<i>Education Level Persons 25+ (1990)</i>												
<high school diploma	803,872 32%	95,678 34%	3,753 37%	11,004 21%	41,011 27%	4,424 39%	5,571 36%	5,239 26%	7,127 35%	2,395 43%	5,443 38%	9,711 36%
High school diploma	1,708,228 68%	232,306 67%	6,390 63%	41,167 79%	110,882 73%	6,896 61%	9,895 64%	14,911 74%	13,244 65%	2,844 57%	8,854 62%	17,223 67%
Some college or Associate degree	520,671 20%	72,365 19%	1,574 16%	15,689 30%	34,365 25%	1,882 16%	2,536 16%	5,123 24%	3,585 18%	706 13%	1,964 14%	4,941 18%
Bachelor's degree	267,055 11%	34,377 8%	650 6%	5,647 11%	18,600 12%	777 7%	977 6%	2,880 14%	1,894 9%	352 6%	710 5%	1,890 7%
Graduate or professional degree	142,068 6%	18,478 5%	287 3%	2,449 5%	9,482 6%	371 3%	496 3%	2,520 12%	1,441 7%	136 2%	483 3%	813 3%
<i>Households</i>	1,499,269	198,886	5,852	30,718	93,248	6,065	9,129	13,669	12,644	3,321	8,361	15,879
Family households	1,089,882 73%	142,208 72%	4,219 72%	23,334 76%	65,122 70%	4,314 71%	6,819 75%	9,019 66%	9,095 72%	2,505 75%	6,225 74%	11,556 73%
Single male head of household	52,471 5%	6,318 4%	200 5%	924 4%	2,949 5%	225 5%	346 5%	395 4%	424 5%	127 5%	244 4%	484 4%
Single female head of household	234,129 21%	32,525 23%	907 21%	3,923 17%	17,049 26%	910 15%	1,644 24%	1,869 21%	2,288 25%	552 22%	1,007 16%	2,376 21%
<i>Income</i>												
Per capita income (1995)	\$18,997	\$14,766	\$14,418	\$18,886	\$21,420	\$14,617	\$17,829	\$17,736	\$14,687	\$15,092	\$15,470	\$16,165
Household income (1990 Census)												
< \$5,000	188,156 13%	25,980 16%	1,058 18%	2,533 8%	10,951 12%	972 16%	1,683 18%	2,330 17%	2,185 17%	643 19%	1,369 16%	2,256 14%
\$5,000-14,999	355,175 23%	51,349 29%	1,745 30%	6,044 20%	22,064 24%	1,909 32%	2,625 29%	3,464 25%	5,601 44%	1,041 31%	2,444 29%	4,412 28%
\$15,000-24,999	282,504 19%	37,900 19%	1,194 20%	6,224 20%	17,484 19%	1,142 19%	1,740 19%	2,277 16%	2,276 18%	649 19%	1,728 21%	3,186 20%

\$25,000-49,999	441,182 30%	57,813 27%	1,347 23%	10,940 35%	27,695 30%	1,484 25%	2,212 24%	3,761 28%	2,966 24%	811 24%	2,141 26%	4,456 28%
\$50,000-74,999	153,865 10%	18,799 8%	395 7%	3,879 13%	9,497 10%	422 7%	659 7%	1,236 9%	851 7%	148 4%	519 6%	1,193 8%
\$75,000 and up	77,489 5%	8,655 3%	160 3%	1,228 4%	5,267 6%	111 1.5%	246 3%	625 5%	439 3%	49 1.5%	174 2%	356 2%

Northwest Parishes Summary Data (continued)

Characteristic	Louisiana	Northwest Region	Bienville	Bossier	Caddo	Claiborne	De Soto	Lincoln	Natchitoches	Red River	Sabine	Webster
Poverty (1990)												
Total in poverty	967,002 24%	130,002 28%	4,824 31%	13,592 16%	58,539 24%	5,096 32%	7,454 30%	9,310 27%	11,594 34%	3,216 35%	6,041 27%	10,336 25%
18 and over	586,060 20%	79,178 26%	3,037 28%	8,115 14%	34,260 20%	3,393 29%	4,635 26%	6,608 26%	6,815 39%	1,961 31%	3,743 24%	6,611 22%
Children < 18	377,143 31%	50,282 36%	1,768 40%	5,415 22%	23,986 34%	1,703 40%	2,795 38%	2,688 28%	4,755 45%	1,250 44%	2,256 36%	3,666 33%
Families	213,030 19%	28,219 23%	1,102 26%	2,987 13%	12,505 19%	1,119 26%	1,691 25%	1,818 20%	2,556 28%	743 29%	1,343 21%	2,355 20%
W/child < 18	162,199 26%	21,160 31%	767 36%	2,379 17%	9,578 27%	752 33%	1,232 32%	1,251 25%	1,986 38%	564 40%	960 30%	1,691 28%
W/child < 5	79,191 30%	10,618 37%	349 38%	1,282 22%	4,746 33%	357 42%	625 41%	652 32%	1,033 46%	314 50%	487 34%	773 33%
Female headed households	114,006 50%	16,416 56%	455 58%	1,645 43%	8,168 49%	519 56%	934 58%	1,023 54%	1,363 63%	377 65%	596 62%	1,336 54%
W/child < 18	98,525 60%	13,981 66%	384 70%	1,435 50%	6,967 59%	444 66%	787 68%	802 60%	1,195 75%	348 78%	510 74%	1,109 63%
W/child < 5	47,330 73%	7,053 78%	171 74%	791 64%	3,382 74%	226 78%	426 85%	398 74%	652 84%	202 87%	268 79%	537 76%
Transfer payments (thousands of dollars 1994)												
Medical payments	\$4,695,477	\$824,752	\$33,869	\$125,902	\$387,530	\$30,927	\$41,353	\$58,298	\$61,469	\$19,176	\$44,298	\$21,930
AFDC	\$194,397	\$18,915	\$703	\$1,786	\$10,224	\$697	\$1,208	\$1,215	\$1,712	\$372	\$675	\$323
Food Stamps	\$676,979	\$79,408	\$2,858	\$8,827	\$41,572	\$3,126	\$5,333	\$4,840	\$6,737	\$1,542	\$2,984	\$1,589

# of food stamp participants (1993)	779,149 18%	103,959 21%	3,669 23%	10,944 13%	49,357 20%	4,147 24%	6,913 27%	5,780 14%	8,954 24%	2,389 25%	4,297 19%	7,509 18%
-------------------------------------	----------------	----------------	--------------	---------------	---------------	--------------	--------------	--------------	--------------	--------------	--------------	--------------

Northwest Parishes Summary Data (continued)

Characteristic	Louisiana	Northwest Region	Bienville	Bossier	<i>Caddo</i>	Claiborne	De Soto	Lincoln	Natchitoches	Red River	Sabine	Webster
<i>Vital Statistics</i>												
Migration (1989-90)	-59,201	-12,472	-241	-2,178	-5,957	-190	-594	-363	-1,241	-364	-788	-556
Births (1994)	67,802	8,069	216	1,291	3,753	227	405	575	542	162	304	594
Infant/1,000 births (1993)	11	9.2	9.1	6.7	12.7	4.8	12.2	12.8	10.5	14.4	3.4	5.3
Out-of-wedlock Births (1994)	28,893 43%	3,483 43%	100 46%	377 29%	1,820 48%	116 51%	208 51%	262 46%	167 31%	76 47%	115 38%	242 41%

Regional Composite

Socio-Economic Indicators

One standard metropolitan area is located in the region, the Shreveport-Bossier City Metropolitan Area, that includes Caddo, and Bossier parishes. Socio-economic indicators for this area (especially Bossier) tended to be better than the regional averages, but since the difference was only 2%, the area was included in the regional figures. It should be noted that several gaming establishments are based in the area.

The Northwest Region is home to 13% (545,527) of the state's total population. Approximately two-thirds of the residents live in urban areas, with the remaining one-third of the population residing in rural areas. This region mirrors the state for most socio-economic indicators (see Table 7). Some items though, are noteworthy for divergence. The race figures for this area are slightly different from the state's percentages, with the region reporting 63% of the residents as white and 36% black and the state reporting a 67%/31% split. In general, income and poverty measures indicate that this region has 5-7% more of its residents below the poverty level than the state as a whole. The 1993 per capita income figure for the Northwest Region was \$14,766, was 88% of the state per capita of \$16,612. Only the Bossier/Caddo area reported higher per capita income than the state.

Infrastructure and Institutions

The Northwest Region is bisected by 3 Interstate systems, and numerous U. S. and state highways. The region supports 4 rail lines and is serviced by up to 50 motor freight carriers. A commercial airport is located in Caddo Parish (Shreveport), and all parishes have local airports. The nearest deepwater port is at Lake Charles, 222 miles from the furthest point in the Northwest Region. All parishes support financial institutions such as banks and or credit unions. All parishes except Bienville have at least one general hospital, and all are parishes have print newspapers and television stations. All parishes are within an hour commuting distance of vocation-technical schools and colleges or universities (Center for Business and Economic Research, 1995).

Table 7. Southern Region: Comparison of States with Value-added Secondary Wood Products Industries

Characteristic	U.S	Louisiana	Texas	Oklahoma	Arkansas	Tennessee	Mississippi	Alabama	Florida
Population (1995)	262,755,270	4,342,334	18,723,991	3,277,687	2,483,769	5,256,051	2,697,243	4,252,982	14,165,5
Births per 1,000 residents	15.50%	16.20%	17.80%	14.30%	14.10%	14.30%	16.00%	14.80%	14.00%
Births to women < 20	12.80%	18.70%	16.10%	17.20%	19.40%	16.90%	21.70%	17.90%	13.40%
Infant deaths per 1,000 live births	8.40%	10.80%	7.50%	8.80%	10.00%	9.40%	11.50%	10.30%	8.60%
Education (1990)									
% < high school diploma	4.50%	15.60%	7.60%	7.60%	20.40%	16.90%	21.00%	17.40%	7.30%
% high school graduates	75.20%	68.30%	72.10%	74.60%	66.30%	67.10%	64.30%	66.90%	74.40%
% college graduates	20.30%	16.10%	20.30%	17.80%	13.30%	16.00%	14.70%	15.70%	18.30%
Labor Force (1994)									
Civilian labor force	131,056,000	1,939,000	9,384,000	1,540,000	1,207,000	2,665,000	1,255,000	2,031,000	6,824,00
% unemployed	6.10%	8.00%	6.40%	5.80%	5.30%	4.80%	6.60%	6.00%	6.60%
Per Capita Income	\$20,800	\$16,612	\$19,145	\$17,026	\$15,995	\$18,439	\$14,745	\$17,129	\$20,65

Pool of Eligible Workers

Based on the foregoing macro-level data, we can describe the Northwest region as poorer and less educated than the state's population as a whole. This should not be interpreted to mean that the region is in some way substandard, but rather that the socio-economic indicators reflect certain areas that are problematic throughout the state. In some parishes, up to 43% of the potential labor force lacks a high school diploma. It is difficult to know for certain the extent that substance abuse or gambling is a problem for significant numbers of potential workers. Anecdotal evidence, though, suggests that concerns in these areas may be valid. Women comprise 50% or more of the available labor pool in each parish. It should be noted that women also are the head of household for an average of 23% of all families in the region, and of these, up to 78% include children that these women must support. Given the low wages paid to entry level unskilled workers, and the low per capita income rates for the region in general, it is not surprising that government assistance (welfare) has been an option for a significant portion of the pool of workers (Stephenson, 1997).

Research Findings

Employer Interviews

Most business owners indicated that they employed a primarily male workforce with little formal education or skill training, some of whom had a "spotty" work history of job turnover, unemployment, substance abuse, and/or incarceration. We detected that most of the employee turnover occurred at the outer fringe: if a worker lasted more than a month or two, he was likely to stay with the job for a relatively long period of time. Many of these business owners told us it was very difficult for them to keep all of their positions filled, especially entry-level, low-skill positions, this despite the fact that they often paid a little better than minimum-wage for this work. Employers indicated zero tolerance for substance abuse and indicated that employees had little problem with drugs or alcohol at this time. Given the history of many the workers, however, it is reasonable to think that substance use or abuse might continue to crop up as a problem. Most employers had little contact with migrant workers. The migrant workers they hired in the past worked well for a short period of time, then left town. There was little indication that migrant workers would become a substantial, reliable part of the labor pool for this industry.

Education and training

Most of the employers interviewed did not have specific education or training requirements for their entry level positions. Employees were not required to have a high school degree or GED certificate, neither was vocational training a prerequisite for employment. Some employers even suggested that generalized vo-tech training could be something of a hindrance for many of these positions, at least

in part because most shops have their own assembly and finishing methods. All of the employers emphasized that a “willing” attitude was more important than formal education or training.

Technical skills

We asked the employers to identify the skills someone might need for an entry level position in their workplace. Surprisingly, the employers did not emphasize the moderate to high level of skills we might have expected. A common theme throughout the interviews was that a beginning employee needed basic math skills and the ability to read a tape measure. Few employers mentioned basic reading ability as a required skill, and few mentioned even basic cabinetry or carpentry skills as required for an entry level position. Most employers expect to train workers on the job or to assign a beginning worker to a senior worker to learn the various tasks required in their shop.

Work readiness

We cannot overemphasize, however, a refrain repeated throughout these interviews with employers in the wood products industry: More important than any skill is a person’s willingness to work. This attitude, more than a set of skills, defined *work readiness* to these business men and women. Employers consistently emphasized that the “right person” — that is, someone with a positive attitude — could be taught the jobs and skills required in their workplace. Employers described such a person with phrases like, “willing to work from the bottom up,” “willing to learn,” “tough-minded,” “self-motivated,” and possessed of a “work ethic.” They also admitted how often they were fooled by a person whom they thought possessed this quality of work readiness, only to discover that they had been duped!

The employers also indicated that a negative attitude could not be overcome with training and education, that some people simply were “quitters.” One employer who was particularly sensitive to this lack of work ethic said that his workers knew that they could either “haul wood or haul ass.” We surmised that work readiness is an elusive concept, recognizable when seen but hard to predict.

Focus Group Interviews

Education and skills

Many of the comments from the employee focus groups confirmed the reports of their employers. The education level of participants generally ranged from 2nd grade to high school or GED. One man indicated that he had some college level education, while another man described his education as “sorry.” Most of the men had performed a wide variety of jobs, almost always involving heavy physical labor. Very few had vocational training, and for those who had participated in a vocational education program (with the exception of the truck drivers), their training was in a field other than carpentry/cabinetry. Almost without exception the men had no previous wood-working experience. They had learned their current skills “on the job.”

Employee attitudes/motivation toward work

We asked the men to tell us what motivated them to come to work everyday, or to come to work at all. They almost always mentioned responsibility for family and children. Some mentioned that they enjoyed their co-workers or “boss”, or that they simply liked the work they performed at this job. A couple of workers made reference to spiritual or religious motivations.

This issue of internal motivation was important to us, so we probed more deeply. We particularly wanted to know what set these men apart from others who had similar responsibilities but did not respond by becoming steadily employed. In other words, why are these men different from their friends and neighbors who don't work? The workers in these focus groups expressed great disdain for people who did not meet their obligations; they described such people as “lazy”, “cry babies”, or unwilling to carry their share of a load. These workers said, “I got to work, I can't just sit around.” They wanted to take care of themselves and their families without becoming dependent “on a welfare check” or “living off the government.”

Almost to a man, the employees mentioned that the values of work and responsibility had been instilled in them while they were young: they had “chores” when they were “small” and their parents were “role models” who had worked throughout their lives. One man mentioned that his mother “worked two and three jobs” to provide for her children. Another responded that his parents taught him that it was “right” to work.

Attitudes Toward Working With Women

Finally, we were interested in whether work in the forest products industry might be suitable for the small army of women who are about to be eliminated from the welfare rolls in Louisiana. Employers indicated to us that they were perfectly willing

to hire women; however, few of them actually had any women working for them at the present time or in the recent past. Some employers described their shop as a noisy, smelly, dirty, hot-in-the-summer, cold-in-the-winter kind of place and indicated that they just didn't think women would be comfortable there. A few employers frankly expressed reservations about hiring women, describing their workplace as "manly" and their workers as "sniffing around" any time a woman came on the shop floor.

As for the workers themselves, there were mixed opinions about working with women. Most of the workers indicated that they had no problem whatsoever with women in their workplace as long as they did their job. The men in our focus groups seemed equally disdainful of a man who would slack off as of a woman who did the same; they indicated that they would make such a man as uncomfortable working there as they would make a woman. They understood that a woman "has children to support and provide for" and that women need jobs, too. Some employees expressed reservations about a woman's ability to handle the strenuous physical aspects of the job, but indicated that some men wouldn't be able to do the work either! Reflecting their employers' comments about a somewhat crude workplace, a few men indicated that they would have to clean up their language and stories or that a woman would just have to get used to their talk. One man indicated that he just didn't think men and women could work together, saying "you can't make honey and money in the same place!"

The women on welfare comprise a heterogeneous group in terms of their education, training, and work history. Many of the women had a high school diploma or GED certificate; and most of the older women had previously been employed. The younger women were more likely to be high school drop-outs, to have no meaningful work history, and to have been dependent on welfare since the birth of their first child. Most of the women indicated to us that their life plan had included finishing their education and getting a "good job." When we asked these women if they would accept employment in a place like a secondary wood products business, the overwhelming response was that they would do whatever they had to do to take care of themselves and their children. In the past, many of the women had worked at traditionally male jobs involving physical labor, including some women who had worked in forest industry jobs. We believe, then, that in rural areas where jobs and workers may be just about equally scarce, no labor pool should be discounted and no job source should be ignored.

Recommendations

Improve basic education and reorient existing post-secondary training.

The employers we interviewed were critical of existing training programs because they believed the skills necessary for their workplace are best taught on the job. According to these businessmen and women, there are few generic secondary wood products skills. This opinion notwithstanding, we did hear a common refrain indicating the need for better basic education. Basic math skills, and to some extent basic reading skills, are important to these employers. Training that emphasizes the application of these skills could be of critical importance. For example, employers talked about the need for workers to be able to read and follow plans, instructions or guidelines, and to meet the specs of printed plans. There is also a need for workers to be able to complete reports or inventories of the products they have prepared and/or materials they have consumed.

We were surprised to hear many employers refer to their use of temporary agencies not only as a source of temporary assistance, but as a screening mechanism for new permanent employees. They found the temporary agencies to be a better source than the area vocational-technical schools for potential employees with certain skills. Such training centers might partner with temp agencies to gain placement and much needed real world work experience for the students.

We do believe that specialized training could be useful to employees who move beyond entry level positions, and that the owners of secondary wood products businesses should be consulted as to the nature of this training. For example, reliable employees could be trained as forklift operators, and in the loading and management of inventory. Other workers could be trained to operate and maintain heavy equipment, such as saws. In sum, basic education should be enhanced and advanced training for specific skills should be enhanced but, in the opinions of the men and women we interviewed, generic carpentry and cabinet skills training is not particularly useful.

Create a workplace that is flexible, supportive, and predictable.

In asking employees in our focus groups about the factors that motivated their labor force participation, we hoped to gain insight into variables in the workplace environment that could be manipulated in order to increase employee loyalty and performance. If we listen to the responses of these workers, we learn that employers can make small changes that make their work place more attractive for employees. Employees praised employers who “treat us like family.” Employees made this statement about employers who are flexible, caring, helpful with personal problems or emergencies, and who provide them a basic level of support. Where some employers periodically lay-off part of their workforce, other employers structure their business to guarantee their workers 40 hours of work, year-round. When a worker knows that he will be able to have a steady income and meet his personal obligations, he is more likely to feel loyalty and respect for the employer.

Another common theme from our focus groups is that employees like knowing what their work will be day to day: they like knowing what the owner expects and they like being given full responsibility for a task without an owner “looking over their shoulder.” Employers may be reluctant to give over responsibilities for tasks, but it appears the more often they make “partners” of their employees, the more personal responsibility and pride the employees will take in the finished product.

Finally, many of the employers we interviewed offer few or no benefits to their employees, instead paying slightly above minimum wage for entry level jobs. Some workers were satisfied with this arrangement and did not desire additional benefits — typically those with access to the charity hospital system. But many workers indicated that they valued the benefits they had or that they desired a few benefits such as a week’s paid vacation, basic health insurance, or a retirement plan.

Identify on-site mentors for new employees.

We asked non-employed women to describe the motivations and impediments to their labor force participation. These women expressed a deep desire to make a better life for themselves and their children, and many of them viewed welfare reform as a way to jump-start that goal. They want continuing education and training opportunities and flexibility in the scheduling of such classes. The women expressed concern over lack of reliable transportation and child-care facilities, two factors that loom large in their potential to undermine women’s success in the workplace. From our interviews with these women and their instructors we detected the presence of a strong support network that functioned to help the women complete their GED studies or the training program in which they were currently enrolled. We believe it is critical to continue a similar support network at least in the first several months of employment.

We recommend that employers identify job coaches or mentors for new employees. It should be noted that our own research indicates that this approach is not far-fetched. Recall that many employers indicated that they expected to train new employees on the job, that they often assigned a more senior employee to supervise a new worker, and that workers indicated some willingness to help bring a new employee up to speed. Thus, while this recommendation may be particularly useful for employers of women moving off of welfare, we believe it has broad application for any new entry level employee.

Summary: Introducing Value-Added Industries to Economically Depressed Areas as Adjuncts to Welfare Reform Policies.

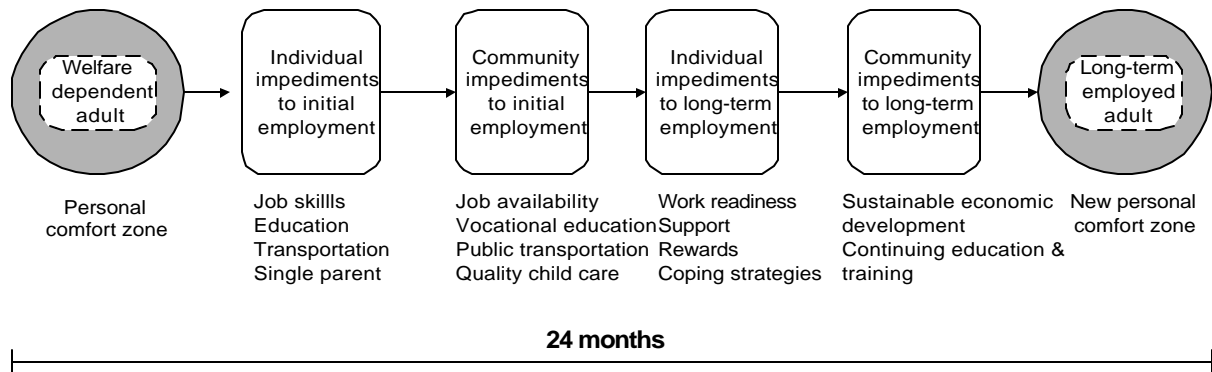
The forestry products business owners that we interviewed indicated that they have a difficult time keeping entry level jobs filled. These employers told us that they expect to train new employees and that they do not expect an entry level person to possess highly specialized skills. They indicated that a *positive attitude* and *work ethic* were the most important factors for employee success.

Many of the people who will apply for low skill jobs in the forest products industry will have a tenuous attachment to the labor force. Workers who feel little commitment to the labor force are likely to bolt the first time they fail at a task or the first time the boss or a co-worker criticizes them. But the reality for many employers is that the labor pool is shallow, and these are the people with whom the employers will have to work. Employers can approach such people from their point of view and from outside of the employers's own middle class values about work ethic, responsibility, commitment to give these work relationships a chance to succeed.

Many job training programs for chronically unemployed persons include a work readiness component with, we believe, a misplaced emphasis on things like resume writing or "dressing for success." These programs instead need to help unemployed people develop coping strategies for things like isolation in the work place, for being called upon to do repetitive or menial tasks, and for accepting criticism from a boss. Workers also need to learn how to create their own support network if none is offered or to find their own mentor if one is not assigned to them (Figure 2). These are innovative work readiness components that emerge from our research and that deserve a trial in job training programs.

Figure 2.

The Transition from Welfare to Work



There is a ready pool of labor about to be made available in rural communities around the state, - women who will be eliminated from welfare program eligibility. Some of these women have a good work history, but circumstances conspired to leave them unemployed and dependent on welfare. Many of the women with a work history had been employed at nontraditional jobs in the past and expressed a willingness to work at nontraditional jobs in the future. Other women with little or no work experience still expressed a willingness to work and move away from welfare dependence. Finally, employers and employees told us women could do the work typical of many secondary wood products industries.

In sum, the equation seems perfectly balanced: employers in small rural communities need workers, rural communities often have limited job opportunities, and women whose welfare eligibility is about to expire need jobs. To the rural employer, no segment of the labor pool is expendable. To the woman coming off welfare, no job source can be overlooked. We see this as a win-win situation for rural employers, residents, and communities, as well as for anyone interested in economic revitalization in this area.

References

Center for Business and Economic Research: Department of Economic Development. (1995). Parish Profiles. Northeastern Louisiana State University. [On-line] Available: <http://leap.nlu.edu/pprof96/shrevepo.htm>.

Cohen, D. (1990). What motivates trainees. *Training & Development Journal*, 44, (11), 91-93.

Johnson, N., & Provan, K. (1995). The relationship between work/family benefits and earnings: A test of competing predictions. *The Journal of Socio-Economics*, 24, (4), 571-584.

Johnson, B., & Ray, H. (1993). Employee-developed pay system increases productivity. *Personnel Journal*, 72, (11), 112-117.

Regional Economic Measurement Division, U. S. Department of Commerce. (1995). Bearfacts. [On-line] Available: <http://leap.nlu.edu/docs1/BFACT>.

Reiger, B. (1995). Lessons in productivity and people. *Training & Development Journal*, 49, (10), 56-58.

Stephenson, E. F. (1997). Even the underprivileged are rational: The incentive effects of welfare. *Journal of Labor Research*, 18, (2), 367-370.

U. S. Bureau of the Census. (1990a). Income and Poverty Characteristics. [On-line] Available: <http://leap.nlu.edu/INCPV>.

U. S. Bureau of the Census. (1990b). Social Characteristics. [On-line] Available: <http://leap.nlu.edu/SOCLC>.

U. S. Bureau of the Census. (1990c.) General Profile: Population and Housing Characteristics. [On-line] Available: <http://leap.nlu.edu/POPHS>.

Wright, P. (1992). An examination of the relationships among monetary incentives, goal level, goal commitment, and performance. *Journal of Management*, 18, (4), 677-694.

Employee Training & Development

Richard P. Vlosky

N. Paul Chance

Often, current educational systems provide little in the way of work force training and development for value-added forest products industries. For example, while there are programs under development in select locations in Louisiana for the pulp and paper industry, largely developed by the industry for implementation in the technical college system, there remains a major gap in the skills needed by today's forest value-added wood products industry sectors.

In order to reach as many owner/managers as possible, the methodology proposes offering educational and training services utilizing varied media including formal classroom instruction, certificate courses, seminars and workshops, computer aided long distance learning and technical videos. In addition, outside expertise may provide specialized machine and process training. The core of an industry-specific training effort would be the establishment of comprehensive curricula into a production management/operations "institute".

Training needs identified in current research include skilled, semi-skilled, business and production management, as well as basic skills and remedial support. Modular home study methods as well as programs of study at a "center" could serve as excellent recruitment incentives to attract new industry.

An Assessment of Louisiana's Current Wood Products Value-Added Training and Development Programs²³

This section of the report examines the current status of education and training opportunities in Louisiana which have direct impacts on the Northwest region of the state.

The current educational system in Louisiana provides little in the way of work force training and development appropriate for the needs of the state's value-added forest products industries. While there are programs under development in select locations for the pulp and paper industry, largely developed by the industry for implementation in the technical college system, there remains a major gap in the skills needed by today's forest products industry sectors.

- Many high schools have abandoned woodworking programs.
- High school courses that remain face a number of problems:
 - a. lack of centralized source for instructor guidance
 - d. antiquated textbooks
 - c. minimal, old shop equipment

²³ Adapted from: Louisiana Value-Added Wood Products Industry Development. Findings and Recommendations of The Governor's Forest Industry Development Task Force. Submitted to: Mr. Kevin Reilly, Secretary, Louisiana Department of Economic Development and Mr. Bob Odom, Commissioner, Louisiana Department of Agriculture and Forestry. March 4, 1997

d. lack of project materials

- High school courses present little or no information on career opportunities.
- Few trade schools in the state offer viable carpentry or furniture building programs.
- A survey of in-state furniture builders indicates that very few had attended high school trade school training programs.

Major Issues

1. Many high schools have abandoned woodworking programs. Increasing drop out rates and decreasing average test scores suggests that we have been developing a student population with a decreasing potential for success in career paths requiring college or higher levels of education. Curricula preparing students for non-professional careers, including carpentry and furniture building, have not responded to the potential demand for trade school training. Instead courses in woodworking and furniture building have regressed at both the high school and trade school levels.

The growing need for non-professional training would be more apparent if more students failed to meet entrance requirements at the college level. Instead, students are accepted with the requirement that they successfully complete remedial courses in mathematics and English. The numbers of such remedial courses have swelled. Many students take these same courses several times before mastering the material. Others never do.

A persisting stigma continues to be attached to the perception of pursuing a non-professional career path. Students retain the belief that successful completion of a college curriculum is a panacea for a successful and financially rewarding adult career.

2. High school courses that remain face a number of problems:

- a. Instructors have no centralized or regional source of guidance.

Instructors at the few remaining high schools that offer woodworking courses feel very isolated. There is no one else on the faculty working in their subject area. Further, these instructors often can not locate a cohort at another school in their area. They also function without any centralized regional or statewide office or person they can turn to for instructional guidance.

- b. Text books are antiquated.

Textbooks are out of date. Although many methods and techniques have not changed, the text, examples and tooling references often are decades out of date. Instructor guides and assistance manuals are nonexistent.

c. Minimal, old shop equipment is the norm.

The remaining high school woodworking shops typically have only the most basic items of equipment. That equipment is usually very old. It often is in need of repair which could make it dangerous to operate and unreliable. Instructors are constantly seeking used equipment that someone is willing to donate. Such machinery is typically not in working condition. Further time is spent by the instructors trying to locate outdated replacement parts.

d. Lack of project materials

Funds for the purchase of materials for class projects are among the lowest priorities at most schools the still offer a woodworking course. Students frequently must spend their own money to purchase lumber and hardware for the project of their choice. The materials that are available will generally include plywood rather than hardwoods.

Project selection is further impaired by the lack of quality materials. Classes often are reduced to building bookcases and shelving for other classrooms.

3. High school courses present little or no information on career opportunities.

Since there are no statewide guidelines, there is no assurance that the remaining high school woodworking courses will offer any developed material or instruction informing students of career opportunities in our state's secondary wood products industry.

The unspoken impression that students receive is that there must not be much opportunity based on the apparent low instructional priority suggested by the outdated textbooks, malfunctioning machinery and nonexistent quality project materials. Conversely, the students attend other prioritized classes with modern texts and computers.

4. Few trade schools in the state offer viable carpentry or furniture building courses.

The number of state trade schools offering woodworking curriculums has also regressed. The programs that continue are sometimes a shadow of the high quality programs that were once offered.

5. A survey of in-state furniture builders indicates that very few had attended high school or trade school training programs.

In light of these facts it is amazing to find that our state has 600-700 small woodworking companies, some of which have grown over the years to employ well over a hundred employees. This industry seems to be developing in spite of, rather than because of the attention it has received to date. One must wonder what might it be, or could it become should it receive the focus of any concerted economic development effort.

Several attempts have been made to develop training programs; to date these efforts have largely failed to develop any programs which have continued beyond the first class. Lacking a high profile industrial and political presence, these efforts have been unsustainable. In fact, much of the equipment and staff associated with these programs are no longer available. Many of the programs were construction industry-oriented and with the demise of the construction industry in the mid-1980s much of the equipment was sold off and staff reassigned.

In addition, with a primarily construction orientation, there is reason to question whether the structure of previous training programs would have been adequate for value-added wood processing and manufacturing operations. Further, with competition for scarce educational resources from other higher profile industry segments such as petro-chemical and gaming, the opportunity for value-added wood industry educational programs may simply have been overlooked. Regardless of the reasons for the current state of value-added wood industry training programs in Louisiana, in order for Louisiana's value-added wood products companies to be able to be competitive in the marketplace appropriate training of the work force must become a priority.

Based on primary and secondary forest products industry hiring intention surveys conducted by the Louisiana Forest Product Laboratory (LFPL) (Vlosky et al. 1995) the number of new employees forecasted over the next 2-4 years totals nearly 4,000 positions. Given this employment demand, as estimated by survey respondents, the need to develop and sustain training programs for the forest products industry is immediate and critical.

Training in Other States

The emphasis on training for value-added forest products industries as a primary tool of enhanced industry competitiveness is demonstrated by several states. In a national survey of state's with forest products industry development programs conducted by the Louisiana Forest Products Laboratory (LFPL) (Vlosky et al, 1995), labor training was one of the top three issues in virtually every state participating in the survey.

The level of commitment varies from state to state with most states undertaking significant programs for industry improvement. For example, Oregon has dedicated

approximately \$1 million for value-added forest products industry labor training to alleviate unemployment and enhance that state's value-added forest products industries' competitiveness. Fox Valley Junior College in Michigan has developed an extensive wood products training curriculum as have schools in Mississippi, Kentucky, North Carolina, Virginia, and Pennsylvania to name but a few. The Architectural Woodworking Institute, a national professional architectural association, is currently reworking its apprenticeship program in response to its members' needs for updated labor training programs in order to remain competitive.

Training Dimensions

While the need for trained new employees has been demonstrated, other training areas must also be addressed. For example, many Louisiana wood products company executives report a need for skills upgrade of existing employees. With the advent of computers in the workplace, ever increasing environmental and labor regulation as well the growing diversity of the workforce many of Louisiana's small value-added wood products companies find it near impossible to remain abreast of these rapidly changing workplace issues.

Further, because of the structure and complexity of Louisiana's educational system there seems to be a great deal of confusion about how to get the training at the time needed in the place needed. In essence, existing educational systems have been unable, because of structure and regulation, to meet the needs of this industry.

Many companies report the need for specialized equipment or process training. Again, the current educational system has been unable to provide the flexibility and diversity of training. In many cases, this may be the result of lack of knowledge about where to locate or outsource a particular expertise, or perhaps, because of a lack of communication between education and industry.

Again the emphasis should be placed on how to deliver appropriate multi-dimensional educational and training services to the value-added wood products industry. This training must also be able to service the needs of a variety of sectors from which new trainees may be drawn. For example, out-of-school unemployed youth represent one possible pool of trainable labor, high school students involved in school to work programs another, adults changing careers yet another, adults coming into the work force for the first time still another. These groups have different needs and require varying training schedules or needs as well as facility support.

In addition, current owner/managers have indicated a need for management and marketing skills as well as technical training in computers and other technology intensive skills. Such training may require distance learning and other innovative techniques which require significant coordination between existing agencies in order to effectively deliver the service.

Add to this the need for specialized and advanced machinery training opportunities for existing employees and the need for a very flexible, yet industry specific, training program becomes very apparent. While the requirements of much of the training needs to be industry specific, there are various agencies in secondary and post secondary education capable of providing technical support for curriculum development and in some cases technology and facilities for service delivery. The difficulty remains in the coordination of programs and program elements.

While the need for flexible and innovative methods of educational service delivery is imperative, in general, the broad nature of the basic skills training required for new hires falls within the realm of relatively inexpensive and generalized equipment.

Research conducted by Drs. Harding, Vlosky and Gazo at LFPL, LSU Baton Rouge indicates that virtually all secondary value-added forest products companies in Louisiana utilize the same twenty to thirty basic machines with a limited number of additional specialized machines used in specific instances. This indicates that most of the state's value-added wood industry sectors could easily be served from a limited number of training centers. Consequently the funds needed to start an adequate training program would be small when compared to the requirements of other capital intensive industry sectors.

In order to reach as many owner/managers as possible, educational and training services may be offered through various media including seminars and workshops, computer aided long distance learning, and technical videos, to name a few. In addition, outsourcing of experts to provide specialized machine and process training can also be utilized.

The establishment of comprehensive curricula into a production management/operations institute utilizing modular home study methods, as well as programs of study at a "center", would also serve as excellent recruitment incentives to attract new industry to the state. Such programs would place the state on par with other Southern states' offerings to wood industry companies. This program could be used in concert with such existing incentive programs as Quick Start, the state's current new or expanding company training offering.

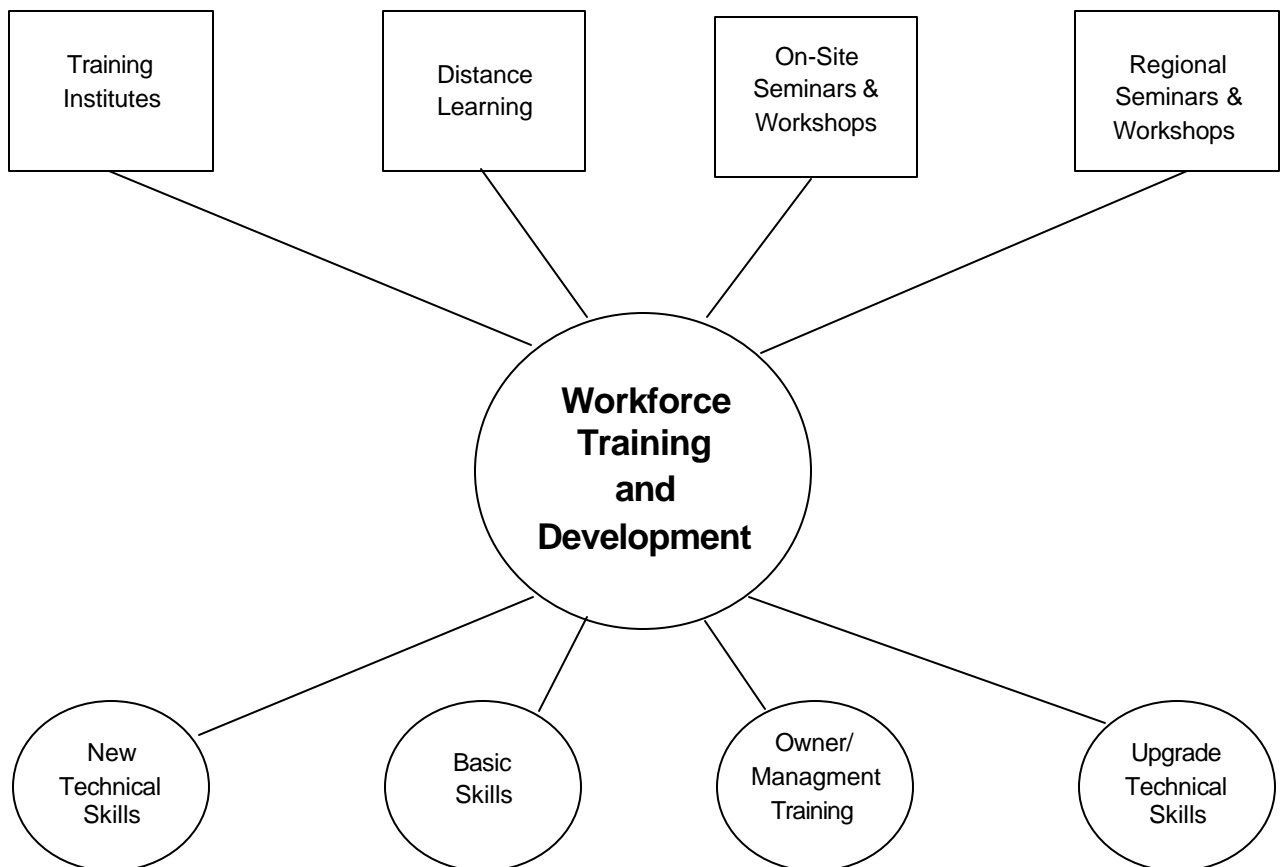
Recommendations

The following recommendations are made under the current status of the educational system in Louisiana. However, because there may be significant changes in the near future to the structure of Louisiana's educational infrastructure in an effort to reduce redundancies and inefficiencies in that system, these recommendations must be considered as tentative. Even with the foregoing caveat,

the need to focus a sustainable educational effort on existing labor, owner/managers and potential new industry employees remains critical and immediate.

Figure 1 shows the proposed structure for a value-added wood products industry training program. The main point is that it would be comprehensive and would draw upon the expertise and support that currently exists in the State.

Figure 1. Training and Development Structure



The preponderance of Louisiana secondary forest products companies located in the Shreveport-Bossier metropolitan area indicates that this would be a logical site for a training facility.

This industry concentration occurs because of very short product distribution channels for Louisiana secondary wood products. Recognizing these influences, one center which is able to provide machine intensive training opportunities could

serve a number of classroom instruction sites within each region. Students would receive classroom instruction on various types of machinery or processes at their respective schools and come to the center on rotating schedules to receive hands-on machine training.

Industry groups or industry concentrations which lend themselves to easy access and communication to serve as intern or apprenticeship sites, as well local placement opportunities for new employees after completion of a long-term training program such as "school to work" or other distributive educational student programs, may be the most appropriate strategy for these sites.

Given the current structure of Louisiana's educational system, a dichotomous structure such as proposed here offers maximum flexibility and access to many resources at a minimal start-up and operating cost. The key is the ability of the system to provide a cornucopia of training programs by developing a network of resources available to accomplish a very complex mission of training and coordination. The proposed program provides an opportunity for all aspects of Louisiana's educational system to be focused on a broad base of industry training needs. This system could serve as a model for future training and development efforts as other industry development opportunities are discovered.

The total program creates an educational value which greatly exceeds the cost to implement the program. While a complete proforma has not been developed for this proposal, the fact of inherent flexibility and adaptability of the proposed programs through the application of network concepts and modular curriculum structures indicates that the value to the State of Louisiana in the establishment of such a program would be immense.

Summary

In this report, we have identified opportunities for value-added wood products industry development in Northeast Louisiana. As is the case with numerous other states and regions in the United States that have made a commitment to forest products industry economic development, we believe that such an effort in the study region is viable. We propose development and expansion of existing value-added industry companies as opposed to only the recruitment of outside companies. Overall goals of any initiative should be to increase employment, attract and expand value-added wood products industry and support rural economic development.

In addition to having an adequate forest resource base to sustain development efforts programmatic implementation success will be determined by:

- strong government leadership
- favorable state economic conditions
- interagency cooperation
- adequate funding
- strong industry support

This results of this research study indicate that the wood products sector industry in the region has significant potential for further development. Beyond the broad product groups discussed in the study, there is likely to exist niche opportunities across a myriad of wood products. However in order to take advantage of potential opportunities, planning and implementation must occur. Northwest Louisiana needs to actively promote the secondary industry before the opportunity to act is lost.