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OVERVIEW OF THE MARKET FOR RECLAIMED LUMBER IN THE SAN FRANCISCO BAY AREA

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Produced for the Wood Reuse Working Group by Jefferson Recycled Woodworks

WOOD REUSE WORKING GROUP

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About the Wood Reuse Working Group

The Wood Reuse Working Group was formed in 1996 to assist non-profit organizations and their for-profit partners in the development of value-added markets for wood reclaimed through the deconstruction of wooden structures. The Wood Reuse Working Group believes that developing community-based, value-added markets for reclaimed wood is the best way to maximize both the economic and environmental benefits of deconstruction for San Francisco Bay Area communities.

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INTRODUCTION

This report provides an overview of the current market for reclaimed lumber within California and, more specifically, within the greater Bay Area. It examines the market forces which are currently shaping the reclaimed wood market, target areas within the general wood market that lend themselves to development as markets for reclaimed lumber, and some of the issues which face anyone wishing to engage in a large-scale reuse effort. This report is part of a larger effort of the Wood Reuse Working Group to develop community-based, value-added markets for wood reclaimed through deconstruction.

METHODS

This report was compiled using information from a variety of sources. A survey of current and potential reclaimed wood consumers was conducted. In it they were asked about their history of purchasing reclaimed wood products, their motivations and their plans for future use. (Survey results have been compiled into a proprietary database not available for public distribution.) Information collected by various members of the reclaimed and new lumber industry was also incorporated, as well as industry data collected by the authors over the course of their business operations. Statistical data collected by trade associations such as the National Association of Homebuilders and environmental organizations such as the Environmental Defense Council was also used.

ASSUMPTIONS

The report discusses West Coast softwood species with an assumed emphasis on Douglas fir, which makes up the majority of lumber reclaimed from the average deconstruction project. Since the organizations who have commissioned this report have a special interest in the deconstruction of military bases in the greater Bay Area, markets will be evaluated for their compatibility with the type of material that typically comes from a West Coast military demolition site.

GENERAL MARKET TRENDS

Several generalizations can be made about the lumber and wood products market as a whole. It is a very price sensitive market and, as a commodity, has a fairly volatile price structure. This has serious implications for any manufacturer using lumber as their raw material. The lumber market is quality sensitive and has a well established system of grading in place. Those who ignore this system do so at their own peril in terms of liability and market credibility. Finally, like almost all other products, the lumber market is convenience oriented. The average contractor likes to buy lumber within a fifteen mile radius from the job site. The average homeowner likes to stay within three miles of home. Specialty wood will lure people a little further, but only if quality and price are also attractive.

The structure of the reclaimed wood market is not as simple as one might think. As with any other commodity, consideration must be given not only to products actually made from reclaimed wood, but to any other goods that can be substituted for those products. When

evaluating the market for reclaimed wood, it is important to assess more than just the handful of industries currently using demolition waste to create something. Markets for reclaimed wood do not act independently of the newly emerging deconstruction market, Reclaimed lumber products are in competition with products created from many other materials (new wood, metal, plastic) and sometimes, direct competition comes from the sustainably harvested wood market.

The Deconstruction Market

The market issues involving reclaimed lumber begin with the deconstruction industry, which acts as both a supplier for and competitor with anyone wishing to market reclaimed lumber. Just ten years ago, the deconstruction of buildings with the goal of reusing the lumber was the hobby of unemployed carpenters and retirees. Today, deconstruction for the reuse of lumber is common. Nationally, deconstruction (as opposed to demolition) occurs to some extent on approximately 40% of all demolition sites over 20,000 square feet. Although this figure includes buildings that are only partially deconstructed, the shift is still dramatic. There is only one reason for this shift - money. Demolition contractors can make money from used wood in ways that were not possible ten or fifteen years ago.

In the early 1980's, when the large scale reuse of West Coast softwoods began, most demolition contractors preferred to burn or implode wooden structures after salvaging the usable wire, pipe and electrical fixtures. In many cases, it was not possible to purchase lumber from a demolition site at any cost because the demolition contractor often had no experience in deconstruction and no financial incentive to learn. That dynamic changed as demand for the larger wood members (6x6 and larger) became greater and consumers became willing to pay for the full costs of deconstruction. Increase in demand continues and is created by many factors including growing environmental awareness, higher prices and lower new lumber quality brought on by over-harvest of our old growth resources. Although in some cases slow to catch on, most demolition contractors now actively participate in the wood reuse market to some extent. Many in the Pacific Northwest have based their business on deconstruction. Seeing a business opportunity, some demolition contractors have even begun to market their own line of reclaimed lumber products.

The effect this progression of events has had on the reclaimed lumber market is as follows: When the demand for reclaimed timbers was low, prices were based on the demolition costs alone. This resulted in a low, unstable price for rough reclaimed timbers. Because of the low demand and selling price, deconstruction was a relatively unattractive option for demolition contractors. This resulted in the destruction of millions of board feet of excess wood. As the demand increased, most demolition contractors raised their prices to meet it (the price of rough reclaimed timbers has effectively tripled in the past five years) and the waste of large timbers from industrial demolition projects dropped dramatically. This history is important because the same phenomenon is in the process of occurring with the smaller, dimensional lumber in demolition projects. This is the type of lumber more commonly found in the demolition of West Coast military bases. The salvaging of lumber four inches in depth and smaller is just beginning to take place on a large scale. Just as at the beginning of the trend to

salvage larger timbers, the most obviously profitable deconstruction projects are being attempted first. However, the quantities of smaller dimension lumber bought and sold in the national (and international) reclaimed wood markets are growing almost weekly. Although we seem to still be at the beginning of the curve in this process, the price of dimensional lumber is definitely following a similar upward trend.

The Reclaimed Lumber Products Market

The reclaimed lumber products market as a whole is connected to, but not entirely the same as, the deconstruction market. The reclaimed lumber products market has been both driven by the increased demand and been the catalyst for it. Reclaimed wood markets fall generally under two categories: primary wood products and value added or secondary products. Primary wood products include lumber, timbers and beams, molding and trim stock, both re-milled and un-remilled, and any other product that directly takes the place of new lumber. Secondary products range from flooring to pot handles; anything which has been made from that primary lumber stock.

The most significant trend in both market categories is "green building" and the growing environmental awareness that this movement evolved from. Building with environmental materials has moved out of the realm of the hippie carpenter and into the corporate boardroom. Concern for the environmental impact of construction is spreading among end users as diverse as first-time home buyers and multinational corporations. A high percentage of the reclaimed lumber supply is very suitable for this market if two large obstacles can be addressed: distribution and cost. The bulk of this market is currently made up of those wealthy enough to pay extra to buy lumber from a very inefficient distribution and manufacturing system. The vast majority of those who identify with the green building concept do not feel able to afford reclaimed lumber. This is an issue that will be covered more thoroughly later in this report, however, since it is such an important factor, it deserves mention in any discussion of the green building movement.

A second issue in the reclaimed lumber products market is the expectation that reclaimed lumber be of higher quality than new lumber. As more people become familiar with reclaimed lumber and seek to use it, the expectation that all reclaimed lumber be of the highest quality becomes more and more unreasonable. In the past, only demolition projects of the highest quality were deemed worthy of reclamation. This put a disproportionate quantity of high quality material on the market. In order to fully utilize the resource and meet the growing demand for environmentally sound building materials, a broader range of material is now being brought to market and customer education is necessary. Although the bulk of reclaimed lumber is of good quality, only about 25% of the reclaimed lumber supply is of a quality unavailable on today's new lumber market. Although the concept of higher quality is a powerful selling point for many buyers, it is possible to overemphasize it. In general, buyers who purchase reclaimed lumber for its high quality must be ready to pay the actual costs of sorting an entire inventory and removing its highest quality stock, leaving the remaining wood less valuable.

The final dominant trend in the general reclaimed lumber products market is the growing reclamation and sale of smaller, dimensional lumber. Although this was discussed

above, it has larger implications for the overall reclaimed lumber market. This trend is helping to make new inroads with middle-income consumers, as many smaller dimension sizes can be used "as is" for common projects. This saves the cost of remilling which has a high labor content and this savings can be passed on to the end user. The use of more dimensional lumber creates some new challenges, as well. The costs of removing lead paint, for instance, is more costly by volume with a 2"x 6" than it is with a 12"x 12". Also, when buying lumber in the traditional manner by units of dollars per thousand board feet (\$/MBF), a secondary manufacturer or end user will pay for 3/4" material as though were full dimension 1". This is called buying "nominal dimension" stock. When using smaller dimension material many manufacturers find that they must buy more air and less actual wood than if they were buying a reclaimed 12x12 that actually was the net size of 11-1/2" x11-1/2". Nevertheless, the trend of reclaiming and using smaller dimension stock is growing and fits very well with the goal of reusing a high percentage of the material from local military bases.

One very important restriction in the reclaimed wood market is the limits on quantity that are created by the variation in supply. For instance, in the new lumber market a supplier can predict supply for a wholesale client in terms of years, even decades. Only a handful of reclaimed lumber suppliers can provide clients with consistency, and those who do can only do so in relatively small quantities. Often, a large or even medium sized lumber supplier can provide a single client with a 100,000 board feet of a product, almost immediately. The reclaimed market today has no manufacturers who can provide this type of service. This had prevented interested companies (the Gap, for example) who have consistent, large volume needs, from using reclaimed wood. Because supply is erratic, this may remain true even with growth of the industry. As obvious as it seem, it is worth mentioning because it creates a major obstacle for entrance to many markets and must be consciously compensated for through planning, and through the offering of other services.

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Market Trends in the New Lumber Industry

Contrary to popular perception, the decline of the solid wood lumber industry began long before the environmental battles of the late 1980's and early 1990's. The supply trends in the new wood industry that are dominant today were identified and planned for as early as the late 1960's. For the past thirty years the wood products industry has been retooling to use smaller, lower quality log stock as the old growth supply dwindles and smaller, younger trees take its place. Today's lumber market is a kaleidoscope of wood particle products, laminates, composites and engineered wood products. Although they are the direct result of environmental degradation, these new products are being touted as a "green" alternative to use of whole lumber and are being used in an attempt to reshape the timber industry's image. This information may seem unrelated to the reclaimed lumber market, but this is far from true. The current trends in the new wood products industry strongly dictate both the markets and manufacturing opportunities available to the reclaimed wood products industry. These trends also provide some interesting marketing opportunities for reclaimed lumber.

Current new wood technology is incredibly efficient from both a materials and a cost standpoint. Additionally, products mass-produced using this new technology are often

stronger, lighter, more consistent and more durable than solid wood lumber. Thus, there are some applications where, from a cost and performance stand point, reclaimed lumber just can't compete. A contractor building cabinets for a 100-unit subdivision would be unlikely to use solid lumber, reclaimed or new, when he can work with sheet goods (plywood, honeycomb board or MDF) at half the time, materials cost and waste. This is important to remember when directing limited marketing energy. Glue laminate beams and engineered truss joists also often take the place of reclaimed lumber products because of their superior strength, performance and lower overall cost. Alternately, the new markets for large timbers and beams, dense grain material, all heart redwood, clear grades of pine and Douglas fir are struggling due to lack of supply. These are markets to which reclaimed lumber had easy entry and traditional success.

The new market trends also shape the manufacturing opportunities for reclaimed wood products producers. Future growth of the reclaimed lumber industry depends on the manufacturers ability to become more streamlined and efficient while using smaller dimension, lower grade rough stock. The new lumber products industry has gone through several generations of technology that is designed for just this type of use. Today, a large lumber processing facility employs millions of dollars worth of state-of-the-art computers, robots and machinery to mill its log stock and create its products. Such equipment would never be made available for runs of lumber that number in only the thousands of board feet and which once contained nails and bolts. Fortunately, the equipment such mills used a decade ago is widely available in smaller millwork facilities around the country. Once educated, many of these facilities can be used in a cost effective way. By subcontracting some production or making a modest investment in infrastructure, a manufacturer of reclaimed wood can gain some of the efficiency enjoyed by new lumber mills, making them better able to compete.

Finally, reclaimed lumber actually benefits from the new lumber industry's dominant marketing trend: greenwashing. As with all marketing, a competitor's advertising can be turned to your advantage if it is sufficiently vague and promoting an entire industry. The new wood products manufacturers "green lumber" ads fit both descriptions. Tens of millions of dollars are being spent promoting the modern, "environmentally sound" practices of the current timber industry as opposed to their own wasteful past practices. This advertising seems to have had the effect of boosting consumer awareness about forestry related environmental issues and, although it is often misleading, it has caused more people to question the sustainability of their building materials.

Market Trends in the Certified Sustainable Lumber Industry

The sustainably harvested lumber industry has emerged at a similar pace to the reclaimed lumber industry. It is driven by many of the same market forces, although its goal and its long-term growth projections are somewhat different. There are two dominant issues in the sustainably harvested lumber market. The first is demand which is growing, but at an uneven rate. Unfortunately, the existing suppliers of sustainably harvested wood in the United States are struggling to meet it. This has dampened the growth of the industry and prevented it from reaching mainstream markets that it would otherwise have access to. The sustainably harvested market shares some key features

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with the recycled market in this respect. Most suppliers, even the more moderate sized ones, have difficulty dealing with large orders, especially if they are ongoing in nature. Supply of rough log stock is still sporadic enough to make it difficult to predict over the long run. In addition, there are only a handful of secondary manufacturers who are large enough and financially stable enough to enter into contracts with major purchasers of lumber. This type of customer often wants expensive and logistically difficult incentives like terms, discounts and "just in time delivery".

At the same time, selling lumber directly on a project-to-project basis is difficult because it is highly labor intensive. Smaller orders are also more difficult to plan for, creating an order file that is less far range and more sporadic. As in most emerging industries, the small and midsize companies are often overextended, wearing "many hats" and serving as manufacturer, distributor and retail outlet all at once. This is not bad, it is simply a statement about the development of distribution systems. In the mainstream lumber industry there is a vast sales network of primary and secondary manufacturers, brokers, representatives, wholesale and retail outlets that allows for company specialization and creates a much smoother flowing market. Although there has been some success in using the existing new wood market as a conduit for existing sustainable products, progress has been slow. As with the reclaimed market, the products offered by the sustainable industry are manufactured on a much more limited and inconsistent scale than most new wood products. This makes it difficult for them to be included in a distribution system which is designed around products manufactured in high volume on a very consistent basis.

The other trend in the sustainably harvested market is certification. Certification is an emerging process in the sustainably harvested industry by which products are guaranteed to be sustainably harvested. This requires that an evaluation of the primary producer finds that they meet the standards of the certifying agency and that a chain of command be established and maintained from primary producer through final manufacturer. Certification has been developed as both an environmental and marketing safeguard. Its benefits from an environmental standpoint are fairly obvious; to maintain and promote a high and consistent standard for the concept of sustainable harvested wood products. From a marketing standpoint the goal of certification is to create a standard which the consumer recognizes as legitimately sustainable and independently measured so that truly sustainable wood products stand out among products marketed as "environmentally friendly" by mainstream wood producers. It is a protection against "greenwashing" and the consumer confusion and cynicism which "greenwashing" creates.

Widespread acceptance of certification has had the effect of increasing the cost of a product already 10%-40% more costly than its new lumber competition. This has had some impact on the retail demand for sustainably harvested wood products, but has also created a market gap that is quickly being filled. What the combination of demonstrated demand, high costs and inefficient, undercapitalized manufacturers has created is an attractive opportunity for mainstream wood producers. Since certification can be obtained for a specific forest or timber sale, some large scale primary and secondary manufacturers are taking their healthiest forests, receiving certification and

using their vast, efficient manufacturing capabilities to offer certified product lines at very reduced prices via the established marketing network. Although this is difficult for the small manufacturers who pioneered the industry, it is a vital step towards fundamental change in the wood products industry toward sustainability.

The sustainably harvested industry relates to the reclaimed industry in many ways. First, outlets which sell sustainably harvested wood are often interested in offering reclaimed wood to augment their softwood products (there is more sustainably harvested hardwood available than softwood). The sustainably harvested industry also helps to spread awareness about the importance of buying wood that is ecologically low impact. At times the two products compete with each other and sustainably harvested wood does offer the customer the advantage of long term sourcing for ongoing projects and products unblemished with fastener marks. However, since sustainably harvested wood is often second-growth, the overall quality of reclaimed lumber is usually superior.

More pertinent are the trends currently shaping the sustainably harvested market. The reclaimed market is experiencing very similar trend cycles and is similarly catching the attention of mainstream, new lumber producers. The same certification process which is used for sustainable harvested lumber is available for reclaimed lumber products but is not in widespread use. This is because the environmental benefits of using reclaimed lumber are much more obvious and stand out to the average consumer more clearly.

The San Francisco Bay Area Market

The current market climate in the greater San Francisco Bay Area is perfect for the expansion of existing reclaimed lumber markets and the creation of new ones. The economic downturn that stalled housing starts several years ago has lifted, creating a steady growth rate in the building industry. In addition, the metropolitan areas that make up this region have very promising mix of positive indicators. The Bay Area ranks high above the national average in disposable income, average education level, average per capita income and has a very high percentage of people in the age bracket between 20 and 60, the bracket when people build houses. In addition, the level of environmental awareness and demonstrated financial commitment to environmental change is high.

SPECIFIC MARKETS FOR RECLAIMED WOOD

Selling or Brokering Un-remilled Timbers and Lumber - Wholesale

One of the most active markets in the reclaimed lumber industry is the wholesale selling and brokering of rough, unmilled timbers and lumber. Even prior to the widespread reuse of reclaimed lumber in residential construction, there was a network in the demolition industry for the resale of larger, untreated, structural members for freeway construction, crane matting, bridge construction and other industrial uses.

If you have access to a demolition project which will yield rough lumber, it is important to understand this market whether you intend to offer the material for sale through the existing network or to sell it yourself. In most instances, this network is the best way to move large quantities of material quickly. The trade off, of course, is that the price you receive will be less than if you have the time and storage space to offer the wood for sale in small quantities, or in a more retail setting. If you are supplying this market then the dominant issues are price, quantity and, to a lesser degree, quality of the material and size.

If you plan to sell to this market your customer will be, above all, price sensitive. Financial success in the brokering market depends upon selling large quantities of material at relatively low prices. As little as five cents per board foot can be a broker's profit margin, which is why quantity is also so important. Quality and the size of the stock come into play in determining how quickly and easily it will be for the broker to move the lumber. Traditionally, smaller stock has not moved as well and therefore has not commanded a price that made it worth saving. However, in the past few years, customer demand has grown to create a market niche for small stock. There are still some brokers, however, who are not fully aware of recent market trends and may not be willing to buy small dimensional stock or pay appropriate prices for it.

Reclaimed lumber brokers also value the logistical abilities of those from whom they buy. If your intent is to develop a long-term relationship with a broker or brokers, it is helpful to be reachable by phone on the job site, have regular, skilled use of a forklift, be able to handle paperwork efficiently and be willing to respect and support brokers proprietary relationships with their customers. Nothing will end your relationship with a broker more quickly than allowing his customer to "go around him" to you. It is also of value to be able to sort for grade on site, and to be able to package units of lumber neatly and efficiently. Removal of metal is generally not necessary in this market unless the metal prevents you from making tight, efficient units. Often, it is difficult to make this market bear the full cost of metal removal if you choose to do it.

Some brokers are from the demolition industry and have been part of the market for many years. These individuals may have their own yard where they will store material or they may use your material to augment lumber from their own demolition sites. Others are relative newcomers to the industry who have become involved during a specific project and recognize the opportunity for profit and/or value the environmental benefits of the product. There are also several brokers from Japan and South America who are currently active in the American market. Each type will have their own ideas about what your lumber is worth and sometimes these ideas will vary radically. These brokers are selling to customers that range from companies doing freeway construction to individuals building musical instruments and everything in between.

The brokering market is all about the art of negotiation. Be prepared and be/act knowledgeable. Know as much about the wood on your site as possible. Be familiar with terms such as "thousand board feet", "vertical grain", "mixed grain", "clear all heart". Know what species you have on your project. Know how to do basic board footage calculations. Above all, know your break even point and the realistic market for your grade, size and species of lumber *before you begin negotiations*.

Many brokers of reclaimed lumber work in a much larger geographical area than the Bay Area. Some of them even deal in both new and reclaimed lumber. For the demolition contractor selling to them, competition will come from many areas and directions. It is impossible to keep track of every person who gets hold of a project with the intent of reselling the wood. People fade in and out of the arena constantly and it can be difficult to identify all the specific competition in this market. You are also sometimes in indirect competition with new lumber suppliers. What is important is to identify the general type of material available at the time you are putting your lumber on the market. For instance, if you have redwood available and several other large redwood projects are also active concurrently, it may make sense to stockpile your redwood until the market is less saturated, giving you a better price.

This type of market research can be ongoing and is done by developing a wide network among lumber brokers and other demolition contractors. A network is important no matter what market of the reclaimed lumber industry you intend to target, but it is vital in this one. The demolition contractor and brokering networks are the most efficient and highly evolved channels in the reclaimed markets. This is not to say that they are anywhere near the complexity of those in the new market, but if used correctly they do provide access to a great deal of information and to many customers that would otherwise be unreachable. In today's market, this network is constantly growing. One source of future activity is the new lumber industry. There are several midsize players in the mainstream lumber industry who are buying up inventories of reclaimed lumber to supplement their milling operations. This trend could radically change the brokering market by making reclaimed inventories more accessible to mainstream secondary and end users.

Regulatory trends that could effect this market include issues surrounding the sale of lumber coated with lead paint. Requirements for disclosure by the seller of the toxic nature of the paint to the buyer could possibly become more strict. There is even a chance that lead paint on lumber might someday need to be removed prior to sale, should the regulatory climate become even stricter.

It should also be noted that there are some complicated regulations by the State Board of Equalization about sales tax requirements when shipping out of state. Anyone selling lumber within California should carefully examine all the pertinent information about sales tax regulation.

Selling Un-remilled Timbers and Lumber - Retail

The Bay Area has a longer history than most metropolitan areas of supporting the retail sale of unmilled, used lumber. The region's demographics lend themselves to the concept of using reclaimed wood although its strict building codes sometimes do not. Unremilled lumber provides customers with relatively low cost building materials of a relatively high quality. Sometimes this value is extremely high, as when the customer buys stock with a usable tongue and groove pattern or a molding pattern on it which would cost four times the price to remill or buy new. Some of the Bay Area sources offer a degree of customer

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service, while others do not. Selling directly from a demolition site brings up the added complication of bringing retail customers into a temporary, active demolition area.

As with the sale of rough wholesale lumber, the primary benefit sought by customers is a lower price for good quality. Unlike the wholesale market however, new lumber is often the direct competition. The price must be low enough to compensate for the lack of other benefits; a high level of customer service, convenient location and uniform lengths and appearance found in a new lumber yard. Buying unmilled, reclaimed wood provides buyers with a sense of history, uniqueness and adventure that they definitely do not find when buying new wood.

Retail customers are looking for a somewhat different type of logistical sophistication than wholesale buyers. They expect to be able to come to a job site or a yard and speakdirectly to a person who is aware of what is for sale, who can negotiate price and who can close the sale. Many expect to be able to do this without prior notice of their arrival. They are not as needy of the type of efficient technical support wholesale customers are (forklift time, cellular phones) which can make smaller retail sales a good option for an underfunded deconstruction project. However, without adequate supervision, retail customers can harass crew members and endanger themselves on the job site.

The lumber is often used for projects which do not require a building inspector's approval or where the lumber being used is large enough to compensate for lack of grade. Sometimes the original grading stamp is still visible, although some building inspectors unfamiliar with reclaimed lumber may still balk at reuse, citing weakening from previous stress load (this is not a justified concern in most cases). Sometimes contractors, architects, or others in the building trade will buy up several thousand board feet from a retail source for use on a specific custom home or a commercial project. If the project is sufficiently well funded, they may choose to have a licensed grader re-grade the material for them.

The average retail customer for unmilled timbers is a male in his thirties to forties who considers himself to be liberal minded and savvy to the business world. He is somewhat adventurous, and willing to take risks. Usually he has had some type of contact with reclaimed lumber prior to his purchase, such as tearing down an old barn while in his twenties. Wood is important to him.

Competition within the Bay Area comes from several sources. There are several retail outlets for unmilled reclaimed lumber run by demolition contractors in permanent locations. These locations offer convenience, a fair degree of customer service and permanence but they often lack selection and sufficient quantities of specific dimensions, even for individual projects. Pricing is usually average to high. At any given time there are one or two actual demolition sites where demolition salvage is being sold to the public from the site itself. These projects usually offer good quantities and prices, but customer service, convenience of location and the ability to form a continuing relationship with the customer are erratic. Organization on these job sites can sometimes be a problem, as well. There are hundreds of retail new lumber yards in the greater Bay Area, which provide fairly direct price competition but currently almost all unmilled, reclaimed lumber can outdistance new lumber in a cost for quality analysis. Finally, there are hundreds of small house demolition projects which can provide the intrepid wood scavenger with free lumber, provided they have good timing. While the price is right, the ability for a customer to use these sources with any regularity is very limited. In some ways this type of project gives people an experience with reclaimed lumber that makes them interested in seeking out a consistent supplier after the demolition project is no longer available.

Future competition, as within the wholesale unmilled market, will probably come from individuals who are already tapped in to the retail new lumber market, but who recognize the value of reclaimed lumber. This area of competition is definitely on the verge of expanding from the occasional inventories of reclaimed timbers in new lumber yards here and there to consistent offerings and advertising. These competitors bring a vast array of assets to the table (experience, established networks, money) but they lack the aura of adventure and the opportunity for negotiation that many customers seek when they buy directly from the job site.

In addition to the potential liability of selling lead based, paint coated timbers to unaware buyers, the seller must be aware of several other liability issues. Retail customers are much less consistently aware of the inherent challenges and hazards that come with using reclaimed wood than professional lumber brokers. They must be educated about potential metal in the pieces, care must be taken to avoid selling any pieces that may have come into contact with chemicals or oil in the course of their use in structure or during demolition. Although a bill of sale with the words "as is" on it are industry standard, there is a different level of liability when dealing with the general public. In addition, if customers are coming on to the deconstruction site, great care must be taken to avoid exposing them (or letting them expose themselves) to hazards like asbestos and falling roof trusses. As always, it is important to know and follow California state sales tax law when doing a large quantity of sales.

Re-milled Timbers and Beams

The market for timbers and beams re-milled from reclaimed lumber is one of the older markets in the West Coast reclaimed lumber industry. As far back as ten years ago, there was an active market for large (6''x 6'' and larger) timbers based on their high density (ring count), clarity and low moisture content. For some customers the fact that these timbers are reclaimed is important on a philosophical level. For others, the reclaimed aspect (and the attendant fastener marks) is immaterial or even a nuisance.

Participating in the re-milled timber and beam market as a supplier is becoming increasingly challenging, but still has the potential to be lucrative. The challenges arise in part because demand for the larger timbers has increased to the point where rough milling stock prices are extremely volatile. Efficient manufacturing and economies of scale also come into play.

Customers in this market generally expect a high level of custom service. The market has traditionally been willing to provide custom milling services and very high quality in

exchange for moderate to high pricing. With the increased demand for milling stock, however, the level of quality is less assured than it once was. Clear, upfront communication with customers and the use of agreed upon standards (such as the ALS grading rules) is especially critical in the timber and beam market in order to match customer expectations with reality.

This is additionally important because re-milled timbers and beams are typically (but not always) used in structural applications. The average project using re-milled timbers is a custom, high-end, large square footage residence. These timbers are often used in conjunction with traditional, stick frame construction where they are usually bigger than necessary from an engineering standpoint.

There is a thriving niche market for re-milled timbers and beams with the post-andbeam, traditional joinery style of construction. The custom nature of these structures, the practical need for large, low moisture content lumber and the growing cost competitiveness when compared to other sources of dry, large stock make a good fit. There is also growing use of re-milled timbers in the straw bale and rammed earth industries. In these industries a combination of the practical need for wood to create roof trusses, the stylistic compatibility of large timbers and the typical customer's commitment to sustainable construction make re-milled timbers a logical choice. It is important to note that a large number of structures like the ones mentioned above are currently being built in the Rockies and the Southwest. These are markets too large to ignore.

There is also some use of re-milled beams and timbers in commercial applications. Often these uses have a limited structural or non-structural value. The commercial use of big timbers is for appearance, the majority of the time. Other, low volume, uses include the sale of particularly clear large, free-of-heart timbers to the wooden boat building industry for mast stock and the sale of particularly dense, clear material to makers of wooden musical instruments. Both of these markets are very limited, but willing to pay very high prices to buy the best stock. These markets underscore the value of careful sorting for grade at all levels of the deconstruction and manufacturing process.

The actual customer for re-milled timbers and beams is often the contractor or builder of the residence or commercial structure. This is not to say that the purchase is always voluntary. Often the owner and/or designer of the project has specified reclaimed lumber. Sometimes the contractor is an unwilling participant. It is important to consider that when targeting the re-milled timber industry you are targeting three types of customers: the environmentally or socially conscious architect/designer, the usually open minded but practical and cost conscious builder, and the owner, who may begin the project prioritizing environmental or social values and end the project prioritizing cost considerations. Customer maintenance during an order can be a balancing act but, in most cases, it is vital that your relationship with the person actually building with the beams be the priority.

There is a great deal of competition on a national and state level in the re-milled timbers market. It is a older market with a number of established companies who have name

recognition, a high level of customer service, consistent access to a range of rough stock and positive market images. These companies, to remain sustainable and maintain the overhead of a permanent operation, often have the highest prices. There are also many newer companies and individuals, particularly in the growing markets of Southern California and the Rockies, that offer slightly lower prices in exchange for slightly less consistent quality and selection of lumber. Then there are always several deconstruction contractors offering re-milled timbers, on site, on a project to project basis. They offer the lowest prices but also have the most inconsistent quality and selection of stock.

Other sources of competition include windfall old-growth log stock, which is dry, free of fasteners and of a comparable quality to reclaimed lumber. Pricing of dry windfall often is very similar to reclaimed, sometimes even higher. Its drawbacks include a sometimes murky environmental pedigree. Large, new, dry timbers are almost non-existent on the lumber market. When they can be found, can be two to three times the price of reclaimed ones. However, large, green (wet) old-growth timbers are readily available and their price is sometimes as little as half that of reclaimed. They are guaranteed to shrink and warp when placed in a structure because of their high moisture content (often 30% vs. 15% for reclaimed). Their environmental history is almost always bleak.

The future trend is, again, that midsized new lumber mills are beginning take interest in reclaimed lumber. Unlike the competition listed above, these mills have the capacity to mass produce single dimensions (truckload quantities of 12x12's, for instance) with minimal handling. This is already happening on a limited basis. In contrast, the current industry handles each stick of lumber individually, making four separate cuts on slow, non-production mills. Widespread use of production milling capability drops the price of re-milled timbers and beams, drops the quality by a much lesser margin and transforms the market to be more compatible with the new market (i.e. truckload quantities of single dimensions produced for anticipated retail sale rather than on a custom basis). The entire construction market is, at its core, very price sensitive. There is a market gap in the current distribution system for reclaimed lumber. There will always be a place for custom re-milling, but because of the aforementioned facts, the switch to more production milling seems inevitable. The only restraint for change is the willingness of manufacturers to put effort into a supply (large reclaimed timbers) that is a limited resource. So far, this has been outweighed by the perception of potential, short term profits.

Regulatory considerations include the disposal of lead based paint removed from the timbers in the manufacturing process and shifts in state and federal laws making disposal more difficult. Liability issues include the subject of grading standards, which change and update regularly. This can be addressed by forming a relationship with a local grading bureau and keeping up-to-date about changes in the grading rules. This can also be addressed by routinely grading all structural lumber leaving your manufacturing facility.

Remilled Dimensional Lumber Markets

The remilled dimensional lumber market is perhaps the broadest and most promising market in the reclaimed lumber industry, today. Dimensional lumber typically refers to

lumber four inches in depth and smaller. It is the largest solid wood market in the new lumber industry, but has been only a small part of the overall reclaimed market until recently. The reasons for this mostly revolve around cost effective deconstruction and remilling, new lumber pricing and distribution. The demand for dimensional, reclaimed lumber is demonstrated and still relatively untapped.

Remilled dimensional lumber shares many of the same qualities as remilled timbers and beams. It is dense, usually dry (although because of its size it is more prone to picking up ambient moisture such as rain) and is often clearer than available new lumber. It has a clean environmental history which is of value to at least 80% of its users. The question must be asked, "Why doesn't reclaimed dimensional lumber take up a larger share in the current reclaimed market?"

The answer to this question is complex. Due to a past public perception that forests were being managed sustainably and government price subsidies to the timber industry, the moral and economic resolve to deconstruct smaller dimension lumber has not existed until recently. Economic resolve in a commodities market as price sensitive as lumber is of key importance. Price considerations still prevent the manufacture of remilled, small dimension lumber in many cases. However, if a better system of distribution can be put in place, demand should facilitate a leap in technology similar to the one taking place in the timber market.

One opportunity to experiment with this market comes from the lead based paint dilemma. The ethical and environmental consequences of putting lead paint coated timbers out on the market makes it highly desirable to remove the paint prior to sale. If this removal could be subsidized initially to facilitate research into lead paint abatement, it could provide a bridge between the intention to save lumber and the realities of the market. Coupled with a good distribution plan, this could be all that is needed to jump-start the Bay Area market for reclaimed dimensional lumber.

Price and logistical considerations are most likely to be overcome, as in the timber market, by use of a production facility. This need not be an highly labor intensive project if a mid-sized mill can be found with extra capacity. The facility would, ideally have an industrial resaw, edger, lathe, planer, molder, shaper, finger joint and dry kiln capacity and a glue deck for laminate lay-ups. In this situation, grading would be done on the deconstruction site as well as at the end of the primary manufacturing process.

There are many barriers for secondary manufacturers wishing to use reclaimed lumber. Some are logistical, some involve economies of scale and some are psychological. Pioneering the market for re-milled dimensional lumber would probably involve becoming a primary and secondary manufacturer under one roof, providing a mix of products tailored toward the most financially successful markets and the available rough stock. In other words, it would mean becoming your own customer. This configuration is fairly common among mid-sized mills in the new wood industry because of its efficiency. Distribution to the end user would still be an issue. One important concern with many of the secondary products made from dimensional stock is moisture content. When using smaller stock it is important to measure moisture content at several stages of production and to protect the rough stock from weather related moisture on the deconstruction site as well as off. Small stock has significantly more surface area per board foot than larger stock and is very prone to fluctuations in moisture content. This causes the wood to expand and contract, opening up small cracks and encouraging warp and twist. In re-milled dimensional lumber and exterior siding, moisture contents as high as 15% to 18% are acceptable, provided that the content remains stable after milling. In interior millwork products moisture content needs to be around 9% and kiln drying for flooring is recommended.

Regulatory issues that are key are the above mentioned lead based paint removal questions, as well as the need to provide pre-graded material to this market. To serve this market correctly, it will be necessary to stamp the grade directly on the lumber. In lower grades this is not a problem. In higher grades, where appearance is part of the grading standards, it is required that a grading certificate, explaining any bolt and nail holes as being excepted from the grade, accompany the wood. This issue would need to be resolved and most likely could be worked out with the local grading bureau you choose to use.

The customers for re-milled dimensional lumber are highly varied. They include homebuilders interested in various grades of construction lumber, millwork shops manufacturing flooring, paneling and siding, molding manufacturers looking for clear vertical grain stock, furniture makers and small item manufacturers.

The General Construction Market

When builders, contractors and homeowner look for lumber to use in construction applications, they are generally looking for framing lumber, various forms of sheeting such as decking, paneling and siding, and finish lumber for sills, doorways and trim. Since Douglas fir is a common and highly preferred species of construction lumber, reclaimed lumber lends itself to the construction market in this way. The difficulties arise due to the price and convenience sensitive nature of this market. Do-it-yourself homeowners are often very price sensitive, as are builders and contractors working on small profit margins or tight budgets.

Additionally, it very difficult for remilled, reclaimed lumber to be competitive with new lumber due to lack of convenience for the purchaser. Currently, to obtain remilled, reclaimed lumber you must custom order it weeks in advance, pay a deposit on it, pay more for it, pay for shipping to your location and then work around its often less-thanuniform appearance and lengths. Reclaimed lumber's low moisture content that is so valuable in some products, can be a problem in construction where the brittle nature of Douglas fir sometimes makes it necessary to pre-drill screws and use nail guns rather than hammers.

Compare the above scenario to the convenience of ordering new lumber only several days in advance, paying on sixty-day terms with a contractor's discount, receiving free

or very inexpensive delivery to your job site and receiving wood with uniform qualities that fit well with the house plans and that everyone on your crew can work with easily. If there are any problems or shortages you send an employee down to the yard for some more wood.

This is not to say that the construction market is closed to reclaimed lumber products, it just has some marketing hurdles to overcome. With some of the more easily changed obstacles to purchase removed, the high quality of the wood and the environmental benefits of the product become much more powerful draws. For example, using finger joint technology to create framing grade lumber from waste shorts (2 and 3 feet) could lower overall board footage costs in an integrated mill, making the product more cost competitive. The market is large, has shown an interest in the use of environmentally friendly building materials and if approached creatively will develop into a key niche in the reclaimed, re-milled lumber market.

The Millwork Market

Millwork includes flooring, paneling, siding and technically any product that is run with a shaped pattern. However, we will keep architectural millwork (molding, rails, etc.) as a separate category in this marketing study because the stock, the production and the market have some divergent characteristics from the other categories. Millwork manufacturers can be challenging customers to sell blanks to, but flooring, paneling and siding are products that have a great deal of end-user interest. Manufacturers buying stock for their millwork shops are often very particular about quality and safety.

Flooring manufacturers, in particular, will be reluctant to risk their equipment or waste time running reclaimed wood unless market demand is very strong. The successful existing reclaimed flooring manufacturers use exclusively reclaimed wood in their operation and run integrated, mid-sized facilities like the type described in the introduction to this section. Although there is a strong new lumber market for Douglas fir flooring, there is currently no one manufacturing reclaimed fir flooring on a consistent basis, here on the West Coast. There is also a demand for pine flooring in wider widths (6, 8 &10 inch).

Flooring can be produced from material ranging from clear, vertical grain, to naily grade, flat grain if marketed and priced appropriately. A very durable parquet flooring can even be produced from properly dried and milled cross sections of waste end cuts. Lengths as short as three feet can be utilized if the millwork equipment is sufficiently modern. This range of usable material allows a great deal of otherwise difficult-to-use stock to be made into a fast selling, value added product.

Paneling and siding products can be produced with a very average grade of lumber and are also fast selling items when made available through good distribution. Siding is generally produced from longer lengths (8 foot minimum), but paneling can have shorts mixed in a random length package or be produced entirely from shorts. They, too, are good candidates for an integrated mill product because they are so universally used in construction and can be produced from a wide variety of material. Even the jacket boards from timbers can be made into a paneling product. All three of these products

can be manufactured by a less than state-of-the-art facility using standard knife patterns. This makes them inexpensive to produce, relative to the value added. They are also products not currently in consistent production in this geographical area.

Architectural Millwork

Architectural millwork includes all types of molding, rail patterns, trim and sill patterns, etc. Producers of architectural millwork are looking for very clear stock with a minimum of defect. This includes knots, checking and any type of fastener marks. At first glance, this seems to make reclaimed lumber an unlikely candidate for use. However, manufacturers are also looking for dry, dense old-growth material that is increasingly difficult to come by on the new market. Aggressive grading of the rough and remilled stock to pull out the clearest pieces, plus use of technology such as finger jointing is the solution to this seeming dilemma. Combined with some guarantees to the manufacturer about the removal of metal from the stock, this is a product that is both marketable and lucrative.

Architectural millwork does not lend itself as well as other products to simple production techniques. Manufacture of architectural millwork is fairly complex, requiring tens if not hundreds of different knife patterns, in-house knife grinding, sharpening and precision millwork. As a specialty market, it also requires a very developed distribution network, which can be difficult for a start-up business to achieve. Providing manufacturers with blanks, however, is a very viable market for the primary processing division of an integrated mill. Architectural millwork could also be a future goal for a satellite business.

Furniture

There are two categories of furniture to be considered in this market: custom manufactured furniture and production furniture mills. Custom furniture manufacturers provide a limited market for the majority of reclaimed material for several reasons. Often, custom furniture manufacturers are low volume by definition. This means that it is difficult to give them cost effective service anywhere but on a retail level. Secondly, the majority of custom furniture manufacturers prefer to work in hardwoods. As one custom manufacturer explained it, "When I build my pieces, I build them to last for five hundred years. Why would I pick anything but the most durable wood species?" Finally, when furniture makers do use softwoods, they mainly use pine, Port Orford cedar and other "white" wood species. It is possible to sell quantities of these species to furniture manufacturers in the Bay Area market as well as outside of it. Douglas fir, with its orange tones and brittle working qualities, is much less popular.

There is a notable exception to this generalization; the commercial store fixture and interior market. A sub-category of the custom furniture market, the fixture market is a growing custom (and production) market providing retail stores and other commercial buildings with wooden fixturing (furniture). A number of well known retail stores and companies have used reclaimed lumber in this way and it is a still expanding market for reclaimed lumber. The same qualities of economy, good strength vs. weight ratio and general durability that make Douglas fir popular as a building material, also make it

perfect for this application. This is another market that, while complex for a start-up mill, might be ideal as a future addition to a product line or as a medium volume customer for the primary manufacturing division.

With a few exceptions, the only production furniture makers using reclaimed wood are also primary manufacturers of reclaimed wood. There is some interest in the Bay Area among established production furniture makers, but it is restricted to species other than Douglas fir and dampened by the cost and convenience limitations of the current market. The savings in shop/labor time, waste and shipping weight solved by MDF and other fiber-based sheet goods makes it difficult for many production manufacturers to justify the use of any type of solid wood for some products. Price in the furniture market is so sensitive due to imports of cheap furniture from Asia and Mexico that production manufacturers are hesitant to deviate from industry standards.

Easy to produce, easy to market items such as shelves and tables would be good items to produce as a mill bi-product, if only to efficiently use waste and scraps. Both items can use short stock and solid, wide "sheet goods" can be produced from narrow stock using a glue-up facility and clamps. Boards with large fastener marks can be incorporated into furniture more easily than with almost any other product and table legs can be easily and cheaply created by lamination of 4x4 shorts which are then turned. There are some good industry examples of production manufactured, wood -scrap-based furniture for use as models, especially on the East Coast.

Small Item Manufacturing

Small item manufacturing can encompass an endless variety of products. Even though many small wood items are imports, there is an endless supply of potential jobs if you connect with the market and can be relatively cost effective. However, there is a common theme among them whether they are gift boxes or sling shot handles. Labor costs are, almost without exception, the driving financial force. Traditionally, small items that require small pieces of wood use waste from the primary and larger secondary manufacturing sector of the lumber industry whenever possible. This material is sometimes free, sometimes purchased, but usually very inexpensive. It is not the wood manufacturer who makes money, it is the item manufacturer.

Primary manufacturing waste becomes much more difficult to use in these markets if it is not uniform. Uniform waste means an efficient process for the item manufacturer, which translates into fewer man-hours and less need for highly skilled labor and supervision. All these factors make small item manufacturing a perfect final complement market to capture what would otherwise be part of the waste flow from a reuse yard/mill. If the manufacturing is done in-house, then issues of uniform waste can be addressed for a profit *and* to reduce wood waste, rather than just for waste reduction purposes. Uniform waste generation can be matched to meet the needs of specific orders with high efficiency. This type of co-manufacturing is industry standard in new lumber mills.

Custom Doors

Custom doors are another potential product with a great deal of proven marketability in the existing reclaimed wood products market. Doors built from Douglas fir and Ponderosa pine sell well as an accessory product to other reclaimed lumber construction products. Doors can provide a high value use of short clears and can also be produced from naily grade lumber. In short, they are an efficient use of wood that can be otherwise difficult to market.

Management of a door shop requires a very high degree of woodworking skill. It is not a high volume market, although there may be market potential for a production door manufactured from reclaimed wood. This has not yet been demonstrated. One of the biggest benefits of providing a door shop in a reclaimed retail facility is the added convenience and design continuity it offers lumber customers. This may encourage additional sales of other products.

Sales to Government Projects

Because of the growing concerns about the environment and waste reduction, many government agencies have recycled content requirements for new construction and renovation projects which are publicly funded. In this regulatory environment, one would think that reclaimed wood would be a perfect fit for government construction. However, there are a number of barriers to its use, both actual and perceived.

It is often difficult for reclaimed lumber manufacturers to invest the time needed to procure government contracts. Bonding requirements, lengthy bid forms, extended terms, "lowest bid" policies and engineering requirements all serve to make it difficult to approach government projects. The large scale of many government projects and the length of time from bid to construction also cause problems due to variable supply.

Some solutions include:

Limited joint ventures between reclaimed suppliers: This is one way to approach large projects, share risk and purchase extra insurance and bonding. It is also a way to share costs of bidding. Inventories can also be combined to mitigate supply problems.

Engineering studies: With large inventories of lumber, private engineering firms can be hired to certify the specific project. More generally, the WCLIB and other grading agencies have been developing a new set of standards that quantify the qualities of reclaimed wood with engineering studies. These studies will be available to the public when they are completed.

Legislation & education: Perhaps the most comprehensive solution involves promoting local, state and federal legislation which requires the problems listed above to be addressed by the agency rather than the supplier. Requirements to offer "points" for reclaimed lumber in the competitive bid process, engineering specifications that recognize general engineering assessments of reclaimed wood by species, funds available to purchase reclaimed inventories prior to the project date, and other changes would make

it more possible for reclaimed wood to find a market in government projects. Educating government officials about the areas where reclaimed wood differs from more standard reclaimed products is another good avenue to promote change.

MARKET POTENTIAL FOR A PRIMARY/SECONDARY MANUFACTURING YARD

In examining the market possibilities for reclaimed wood in the Bay Area, the issue that is least resolved remains product accessibility to the end user. In other words, channels <u>of distribution. There have been very few inroads made into the extensive new lumber</u> distribution networks in the Bay Area or even in California. Nationally, the most successful producers of reclaimed lumber have been forced to be creative, particularly when it comes to product distribution. This has included setting up reclaimed lumber yards offering varying degrees of service and product range. There has been some pairing with new lumber yards to get the broadest possible customer base.

One possibility that has a great deal of potential is the idea of combining a retail yard with a mid-sized mill onsite within the San Francisco Bay Area. This would go far beyond the scope of any existing reclaimed facility in the region and would be a national model for wood reuse. Practically, it would solve many problems typically associated with wood reuse efforts, such as storage, transportation costs between production facilities, efficient use of falldown from primary processing and end user access to a retail outlet. It would also prevent the duplication of staff and equipment. Such a facility could eventually be used to process the large quantities of construction and light (residential) demolition waste which enter the waste stream daily.

Perhaps the most exciting aspect of this idea is the potential use of such a facility as a "wood bank." If the project had adequate storage area, it could provide storage and a potential market for inventories that would otherwise be quickly dumped on the market due to the need to remove them from the demolition site in a timely manner. Each year, the issue of limited deconstruction time causes millions of board feet of lumber to be sold under cost and/or overseas or to simply be chipped and landfilled. This undermines both the industry and the local economy of an area. The creation of a such a facility would perfectly merge the values of wood reuse, waste reduction, community development and social benefit into a cohesive whole.



