

# Starting a Cooperative for Hardwoods and Special Forest Products



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# Introduction

The residents of rural California, particularly in regions traditionally dependent on the logging business, have been either directly or indirectly hard-hit by the loss of business and by high unemployment which is common in rural areas.

Many federal, state and local development organizations have focused their efforts on raising income and employment in rural California. As part of this effort the California Department of Forestry and Fire Protection, with funds from the Economic Development Administration, provided the Center for Cooperatives, University of California, with a grant to develop a document and a series of programs on how hardwood and special forest product cooperatives might be used to raise income and create employment in rural California.

This document has been developed by the Center for Cooperatives in partial fulfillment of that contract. Used as a hand-out in a series of cooperative development workshops in rural California, it is now available for distribution to the general public. In this text, we have tried to present some of the most critical information for new cooperatives in an accessible and useful manner.

We wish to express our thanks to the Economic Development Administration, the California Department of Forestry and Fire Protection, John Shelly, Bob Roan, Dave Parmenter, Karen Sukenic, June Holley, Don Nelson, Pete Passof, Karen Spatz and the numerous others who have provided key information and feedback during the drafting of this document.

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# Cooperatives in the Forest Product Industry

## Is there a place for cooperatives in the special forest products industry?

To answer this question, it is important to examine the industry from the sourcing of raw materials to their final use in furniture, flooring, crafts, food products, medicinals and other uses (Figure 1). The ultimate answer will come from within the industry. Viewpoints on industry needs will vary according to the product-focus and the roles of each participant.

Hardwood trees may be harvested by landowners or by hired contractors. Logs are then transported to mills where they are processed in several ways, by cutting them into lumber, by drying, by planing and by converting them into forms useful to contractors, furniture manufacturers, artisans and others. Even at that point, sorting, sizing, and transportation to final users may be an important vertical link in the industry.

Forest products such as mushrooms, pinecones or botanicals may similarly be harvested by groups of landowners or independent harvesters. The raw product is then cleaned, packed and transported to a central facility where it is stored and processed to add maximum value before a final sale. By pooling the raw product from dispersed harvesters, the cooperative gains the volume to market more effectively than its individual members. By adding a processing component, it achieves a higher profit margin on sales, and retains maximum profits for local members

While cooperatives have unique features which may fit the current needs of rural entrepreneurs, it is important to remember that cooperatives must pass all of the same economic tests as other businesses. For this reason, those who seriously consider starting a special forest product cooperative will have to carefully address feasibility questions before developing a new cooperative.

## Key Questions to Ask Before Starting a Cooperative

1. How large an industry can be sustained given the foreseeable volume of a given product?
2. What is the ideal size and scope for the businesses within that industry?
3. Can the cooperative establish the market linkages needed to market its product reliably?
4. Can feasibility be established?
5. Can the prospective members find a way to finance operation and start-up expense?
6. Will members hire and pay a capable manager?

**FIGURE ONE.**

### The Forest Product Marketing System

Any point in the production cycle may be isolated and analyzed to determine whether cooperative or individual action is most beneficial.



## Where Cooperatives have Succeeded

Cooperatives have a long history in the development of American agriculture, particularly in California. This is especially true of agricultural marketing cooperatives. Such cooperatives, often represented by well-known brand names like Blue Diamond, SunMaid, Sunsweet, Sunkist, Tri-Valley Growers and others, are grower-owned businesses which account for over a third of the \$20 billion in raw agricultural products produced by California Growers.

Cooperatives have succeeded in these businesses because they have directly met the economic needs of independent producers. At the same time, these cooperatives have met the demands of consumer or industrial markets as well or better than competing businesses.

In the last century, cooperatives were used by relatively small farmers to achieve the market power they needed to receive fair treatment from grain buyers. In the Midwest, farmers joined together in cooperatives to assure supplies of petroleum products and fertilizer. They reduced marketing costs by sharing grain elevators and agricultural supply businesses throughout the Corn Belt and the Great Plains.

In California, individual growers of perennial crops found themselves at the mercy of canners and packers. To overcome the imbalance created by many small producers trying to sell to a few large buyers, independent growers used bargaining associations or their own operating cooperatives. These institutions assure a "home" for their members' fruit.

Cooperatives have succeeded in agriculture because 1) Cooperatives have been able to address a need common to all members and 2) the functions performed by cooperative businesses provide most or all of each member's farm income.

Agricultural marketing cooperatives are discussed here because they appear to address situations much like those faced by other rural entrepreneurs.

Many rural entrepreneurs in the hardwood and special forest products industries are now faced with similar economic needs as those farmers who organized cooperatives. Like those farmers, they lack market power and are considering cooperatives as one way to achieve jointly what they could not do independently.

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# What is a Cooperative?

The most basic definition of a cooperative includes *user ownership*, *user benefits* and *user control*. Only member-users own equity in a true cooperative. This is because only members have the right to share in the earnings or other benefits derived from the cooperative.

In a forest product cooperative, independent producers may jointly buy supplies, market their raw product or market a processed product. As member-owners, they share in all earnings.

For example, if members were independent hardwood harvesters who chose to jointly cut and dry their wood, they would share the net earnings of the business based on volume and quality of the product delivered by each to the cooperative. The same would be true in the botanicals industry, if members were

independent harvesters who chose to pool dried herbs, and then jointly pack and market them as tea. Joint action may occur at any point in the process that makes sense. Members may decide to purchase packing crates for their product together in order to benefit from bulk purchasing discounts. Regardless of the type of joint action, members share the earnings or savings from joint activity and do so in proportion to use of the cooperative.

Importantly, a cooperative is democratically controlled. Its member-owners, usually on a one-member, one-vote basis, elect a board of directors to hire and oversee management of the business. In contrast, in an investor-owned firm, the typical form of business in the U.S., control is distributed in proportion to investment.



**Case Study:**

**California Hardwood Producers –  
Cooperative Milling, Drying and  
Processing**

**California Hardwood Producers  
1980 Grass Valley Highway  
Auburn, CA 95603  
tel: 916/888-8191**

California Hardwoods Producers was established in November 1993 as a hardwood processing cooperative. The four founding members arranged to lease the long-abandoned Bohemia Mill in Auburn, and moved their individual woodcutting operations under a shared roof. The business has established a niche contracting with cities like Sacramento for waste wood, which they then cut, dry and process for quality lumber, flooring, and furniture.

Now, two years later, the business is starting to see its first profits, and trying to keep up with a growing demand for their hardwood flooring as well as developing new export markets for specialty woods. But getting here wasn't easy. As founding member, Dave Parmenter describes it, the first mistake he made was going into business with partners who didn't share the commitment or skills to pull off the

ambitious plan to develop a new kind of hardwoods business. Within four months, two co-op members had dropped out, leaving a two-person partnership at the helm. California Hardwoods Producers remains a partnership with a cooperative legal structure, and will likely resume as a cooperative once the business has the minimum three members necessary to qualify.

Financing has been a challenge. A strong team effort by the business founders and the Sierra Economic Development District resulted in a start-up package which combined member equity-investment and collateral with state and federal financing assistance. By now, says Parmenter, the business needs another loan to finance inventory and allow the business to keep up with the demand for their products.

The firm has made a splash with their hardwood floors made from native California trees like tan oak, madrone, and others that have been viewed as "junk" trees by an industry that has traditionally preferred softwoods. Enthusiasts are not limited to the buyers though, cities who sell their "waste" wood to California Hardwood Producers have found a new way to save their landfills through recycling.

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# How Cooperatives Compare to Other Businesses

**A**s a user-owned business, a special forest product cooperative would differ from investor-owned businesses in terms of ownership, control, tax treatment and the distribution of benefits. Its bylaws would be written so that only those who, for example, sell their raw product through the cooperative (who "use" the business) could be members. Further, since earnings are distributed on the basis of use, only users would want to own stock and be members.

In contrast, most businesses are investor-owned. They distribute earnings in proportion to capital investment. But forest product cooperatives would differ from these firms in other respects as well.

Cooperatives are granted special tax status by the IRS (Subchapter T), and their members have less financial liability than do partners in some investor-owned firms.

In general, corporations which qualify as cooperatives under subchapter T of the Internal Revenue Code do not pay federal corporate income taxes on "member business" income at the level of the cooperative. Instead, earnings are taxed as personal income when received by members. In this respect, cooperatives are more like sole proprietorships and partnerships than investor-owned corporations which pay federal taxes on corporate earnings and are taxed a second time when earnings are distributed to stockholders as dividends.

Incorporation as a cooperative confers limited liability to stockholders. In this respect, cooperatives are treated like investor-owned corporations, rather than proprietorships and partnerships, both of which leave stockholders with unlimited liability.

**TABLE ONE.**

## Comparison of Five Forms of Business Organization

<b>Form</b>	<b>Control</b>	<b>Tax</b>	<b>Financial Liability</b>
Proprietorship	Proprietor	Individual rate	Unlimited
Partnership	Partnership, based on equity contributions	Individual rate	Unlimited
Limited Liability Company	Members, under an operating agreement	Individual rate	Limited
Corporation	One vote per share	At corporate rate, plus dividends at individual rate	Limited to initial contribution
Cooperative (incorporated)	One-member, one-vote, and/or in proportion to use	Individual rate (member business); corporate rate (non-member business)	Limited to initial contribution and retained earnings

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# When Do Cooperatives Work Best?

**C**ooperatives are not the best way to organize every business. A cooperative arises from group action to further *common interests* and the greater the number and diversity of members, the more difficult it is to assure that individual goals are consistent with group goals. In an investor-owned business, objectives can be more easily defined in terms of a common denominator (return on investment) which applies to any investor, anywhere. This distinction between cooperatives and investor-owned firms, along with experience gained in agricultural cooperatives, is central to identification of the following situations in which cooperatives work best:

## **When there is a clear, common objective**

The members of any group work better together when they have a clear, common goal. This is especially critical when a group of people invest their financial resources in a business they intend to *use*.

## **When user-ownership enables members to create value that an investor-owned business can't or won't create**

If there is not something unique about how a cooperative produces or markets a product, an investor-owned (conventional) firm can and probably should do the job.

## **When there is a viable business opportunity**

Cooperatives cannot perform economic magic. Like any other firms, they must pay for raw inputs, interest, wages, and employee benefits. A cooperative which uses costly inputs will have to cover costs before it can return any earnings to its owners.

## **When the business is well-managed**

Without good management, scarce resources will not be efficiently used. Hiring good management and letting it operate is sometimes a challenge for cooperatives whose members, as owners, want to make their presence known in operations.

## **When there are economies of scale**

When otherwise independent persons or businesses can achieve something jointly that they could not achieve as individuals, this is usually because there are "economies of scale." In everyday terms, producers may individually harvest a forest product because there are no or few economies of scale, but the volume of several harvesters is required to reduce the costs of drying and processing to a level that makes them competitive suppliers. Cooperatives appear when there are limited economies of scale at one level in an industry, but great economies at the next level.

## **When success is important to members**

Cooperatives work best when income from the cooperative accounts for a good share of each member's personal income. Agricultural marketing cooperatives probably succeed in large part because the cooperative represents an assured market for a relatively large share of each grower's harvest.

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# Is there a Place for Hardwood and Forest Product Cooperatives?

Those in each sector of the industry must ultimately decide how great the potential for cooperatives is. However, several features of forest product-based industry suggest that the issue is worth pursuing.

## **Independent, small scale operators**

Prospective members of the cooperative are relatively small, independent individuals or pairs. They assemble raw product on a scale that would not be attractive to larger operators. In this respect, they are like agricultural producers.

## **Many share common needs**

In addition to ample work space, harvesters and processors need the working capital which will enable them to store their inventory until they reach enough volume to gain a strong selling position. Hardwood lumber producers, in particular, need to be able to carry their inventory for several months or more. A cooperative can supply the necessary working capital.

## **Producers can achieve scale economies**

While the prospective members of the cooperative may harvest on a very small scale, it appears that most of the activities they propose to pursue jointly do offer an opportunity for scale economies. Virtually all processing and marketing activities require the purchase of fixed assets which a small to

moderate size supplier of raw product is unlikely to use at capacity. Producers can reduce unit costs by sharing this equipment with others. For example, in the hardwood industry, activities that benefit from scale economies include grading the timber, cutting logs into boards, kiln-drying the product, planing cut boards, finishing product for flooring and other uses, and marketing the product to final users.

In the same sense that the producer can reduce processing costs by sharing costly capital equipment with others, joint hiring of technical expertise and a marketing person to move the processed product adds value to the product and reduces the cost to each producer.

## **Producers are seeking a livelihood**

There is good reason to believe the success of a cooperative would be very important to the members, who rely on their business for a paycheck. It would not be a sideline or a casual interest.

## **There is a demonstrated business opportunity**

There is growing evidence that this kind of business can be pursued profitably, especially for businesses that identify a strategic market niche for their product. In the hardwood and botanicals industries, independent entrepreneurs are already harvesting on a small scale and demonstrating their ability to add value by processing the raw product.

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# Legal Considerations in Cooperative Start-up

**A** botanicals cooperative may, for example, be composed of members who sell herbs to their own cooperatively owned business. Members may include those who harvest from their own land, arrange to harvest from other public or private land, or cultivate their product in greenhouses. Most forest products cooperatives will qualify as Agricultural Marketing Cooperatives in California. However, a cooperative owned solely by hardwood processors (not landowners or cultivators) has already been denied agricultural status in California. Criteria for incorporation varies from state to state. For assistance in incorporating, sample legal documents and guidelines are available from the Center for Cooperatives.

## Incorporation

Incorporation of any business is carried out under state incorporation statutes. In California, separate statutes are created to incorporate agricultural bargaining, agricultural marketing, consumer and fishery cooperatives. These separate statutes are created to legitimize the specific activities of cooperatives as distinguished from investor-owned corporations.

In terms of legal structure, the cooperative would fall under the agricultural marketing cooperative statute of the California Food and Agriculture Code, as long as members have some role in cultivation or own the land where

their product is found. Cooperatives whose members are processors, but not cultivators (hardwood millers, for example) would qualify for incorporation under California's Consumer Cooperatives Code. Generally, it is beneficial to incorporate under the agricultural code if possible, due to favorable securities and antitrust exemptions. Regardless of the incorporation code, cooperative bylaws stipulate that it operates on a cooperative basis through democratic control and the distribution of earnings or other benefits in proportion to use.

In terms of legal structure, a non-agricultural cooperative would behave *much like* a stock cooperative of the sort incorporated under the agricultural marketing cooperative statute of the California Food and Agriculture Code. However, unless all members were landowners or cultivators who could legitimately claim to "farm" the trees, members of the hardwood industry would not qualify as agricultural producers as defined in the Food and Agriculture Code. This is because, by law, members of an agricultural cooperative must participate in the planting, cultivation, or production of the trees.

Therefore, we are recommending that the business be incorporated under California's Consumer Cooperatives Code. Its bylaws would stipulate that it operates on a cooperative basis through democratic control and the distribution of earnings or other benefits in proportion to use.

Sample legal documents for an Agricultural Marketing Cooperative, produced by qualified counsel, are available from the Center for Cooperatives. These include incorporation papers, sample bylaws, and others required to create a producer cooperative. While sample documentation can save a group time and money by allowing them to do much of the work of incorporation themselves, *it is crucial to consult qualified legal and accounting experts during any incorporation process.*

Federal and state laws have been passed to enable or support cooperative operations in several industrial sectors of the United States. Special codes regulate the incorporation of cooperatives, the antitrust protection for those who form cooperatives and the exemption of certain cooperative earnings from corporate taxes.

### **Tax Treatment**

Most important to a forest products cooperative would be Subchapter T of the U.S. Internal Revenue Code. Subchapter T exempts firms *conducting business on a cooperative basis* from corporate income tax

earned on member business. In general, corporate taxes do not apply to "patronage sourced earnings" (earnings through business done with members) at the cooperative level. They do apply to personal income distributed to members in proportion to the value of products delivered.

In this respect, the tax treatment of cooperative earnings is much like that for earnings of partnerships and sole proprietorships. In both cases, the earnings are taxed at the individual level of the partner or proprietor and not at the level of the business. The member may have tax liability not only on the cash portion of earnings, but also on any share of the earnings distributed as stock in the cooperative. Like any other business, cooperatives are obliged to pay virtually all other business, sales, employee and other taxes.

The general information presented here is not offered as a tax guide. The directors and managers of a cooperative, no less than any other business, are best advised to hire knowledgeable, qualified tax specialists to calculate and file their taxes and tax forms.

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# Marketing Strategy

It is important that organizing members conduct a realistic assessment of the internal strengths and weaknesses of their business, along with external opportunities and threats to the success of the proposed cooperative. This process is important in helping members understand what they can realistically expect of their cooperative and to know what they must do to succeed.

Indeed, the number of marketing strategy options is very limited: They include: 1) *a commodity or least cost marketing strategy* and 2) *a differentiated or "niche" marketing strategy*. In brief, the cooperative members must decide whether the cooperative will fare best by trying to compete with high volume suppliers of undifferentiated raw products or whether they will be suppliers of high service, low volume, and higher quality products to specific markets. To make this determination, they must examine their costs, their competitive advantages and their weaknesses. An assessment of marketing options would be organized and led by a planning committee in preparing to help members decide what approach to marketing offers the greatest likelihood of success.

## **Initial market assessment: where to start**

Any producer needs to test the market early on to identify potential buyers and decide whether to continue or revise the feasibility process. John Gladding, Loan Officer at the Redwood Region Economic Development Commission offers the following advice:

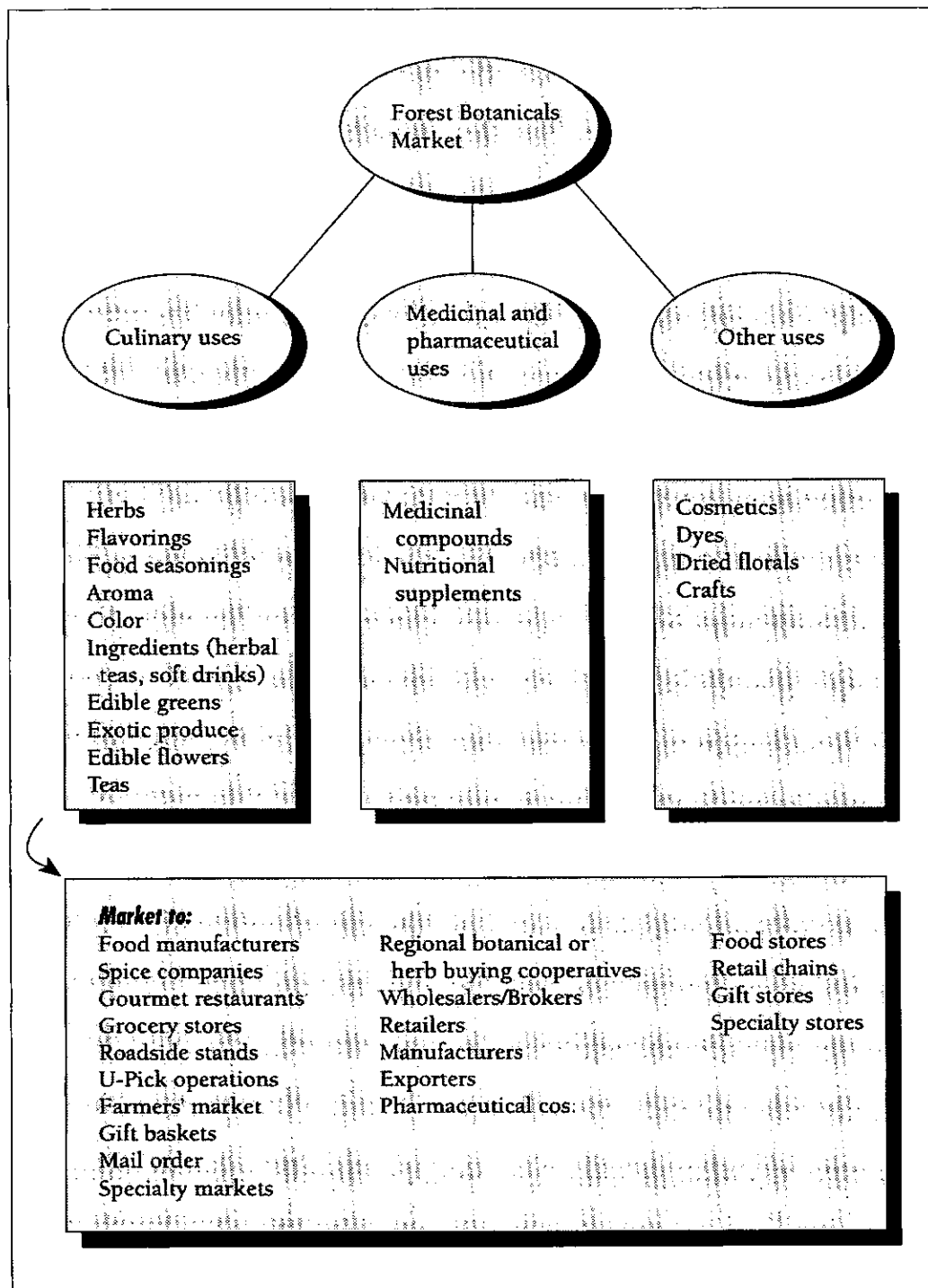
Organizers of the cooperative will need to contact potential buyers and ask them how much if any of your product they will buy. A good place to find buyers is the local library. The reference librarian should be able to show you trade journals, business guides, and business-to-business phone books that will list the cooperative's potential customers. Develop a list of questions to ask potential customers, such as

- What type of wood/forest products do you buy?
- Are you looking for additional suppliers? If not, why not?
- What specifications or requirements for individual products do you have?
- What is the minimum quantity you buy?
- Would you be interested in buying any products from our cooperative?

You will probably have to make many phone calls to get cooperation from just a few businesses, but the information will be valuable. It will help you decide what products are likely to sell.



# Emerging Market Niches: Forest Botanicals



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# Financing a Cooperative

**C**apital Requirements: Securing capital to start and maintain a producer cooperative is sure to be a major concern of the prospective members. Investments required to begin operations may include harvesting tools, a kiln to dry lumber, wood-finishing equipment, packing and processing equipment, vehicles, and storage facilities.

Beyond start-up capital, producers need working capital to operate the cooperative. While this includes funds to pay management and labor, the greatest working capital requirement is to finance inventory for the months that may elapse between the harvesting of raw product by members and the purchase of that product from the cooperative. The cooperative should be able to cover the cost of raw material, labor and other expenses which go into the process. A properly capitalized cooperative should have the financial reserves to pay members market value for any raw product, upon delivery to the cooperative, although some new cooperatives don't reach this ideal at first.

## Two Kinds of Capital

Cooperatives, just like any other business, need both "equity" capital and "debt" capital to start a business. *Equity capital* is capital provided by the owners of the business. In this case, the owners are the members of the cooperative who use its services and have a right to its earnings. The equity capital is the measure of their ownership in the business and is referred to as members' equity.

Since most entrepreneurs do not have sufficient capital to start a business by themselves, they almost always need to have a loan to secure all of the capital they need. This capital is secured from a lender and it is called *debt capital*.

## Approaching a Lender

A thorough business plan is mandatory (see Appendix I for guidelines). As expressed by the Rural Economic and Community Development Administration, "*the first step in securing financing for your business is not filing a loan application. Instead, the business owner needs to develop and refine a business strategy. Nothing improves one's chance of securing financing like a thorough business plan with informed financial projections.*"

Before discussing a loan seriously, the lender will have to be convinced that the borrowers have a clear idea of the purpose of their business. Borrowers should be prepared to clearly state what they are going to produce, in what volume, where they are going to source raw material, how they are going to market the product and what assurances they have that they will be able to sell what they produce. Questions about experience and managerial skills also need to be addressed.

Sources of technical assistance for prospective borrowers who are developing a business plan include California's Small Business Development Centers, the Service Corps of Retired Executives, and nonprofit entrepreneur assistance organizations. (See page 24 for a list of cooperative business development resources.)

After conducting required research and using it to develop business and marketing plans, the borrowers will know how much capital they need and be prepared to talk to a lender. These initial findings may lead the organizers to talk first to the Small Business Administration, the Rural Economic and Community Development Administration, the National Cooperative Bank Development Corporation or, depending on the capital

resources of the borrowers, a commercial bank. Each of these lenders is equipped to make loans for different amounts, risk levels and borrowers.

### **Grant Funding**

Rural entrepreneurs may qualify for public or private grant funding on the grounds that they are contributing to local economic development and job creation. Grantors will be more likely to supply equity capital if their contribution will leverage otherwise inaccessible bank loans.

### **The Need for Equity**

However convincing the feasibility, business and marketing plans presented to the lender, the most supportive lenders will require a commitment of equity — investment of the owners' own risk capital — to the business.

Generally, start up businesses will face equity requirements of 20 to 25 percent even when government agencies guarantee a bank loan. This level of equity requirement may discourage many prospective borrowers who see no way to enter a business requiring several thousand dollars in equity investment from each member. However, there have been cases in which local development corporations, in combination with government guarantees, have provided equity from relending sources (like the SBA) in order to finance start-up with the understanding that the intended owners of the program will gradually earn the equity and repay the development corporation. Assembling this type of financing is a complex process which requires time and cooperation from several local agencies and loan guarantors.

### **Transferring Ownership Through Earned Equity**

*Cooperatives are well-suited to the gradual transfer of ownership from one party to another.* If, for example, a development corporation were to provide the risk capital to the operation, this would be transferred to members in the form of cooperative equity.

*Equity can be earned.* Equity in a cooperative can be gradually earned by the member. As members sell their product to the cooperative, they establish rights to a share of its earnings. As long as the cooperative earns money, members can (and may be required to) add equity by taking part of their earnings in the form of equity certificates (stock). The earnings which equity certificates represent would be used to compensate the providers of risk capital and to accumulate working capital. As these contributions grow, the members' equity ownership would grow and replace that of the development corporation or other entity that provided the original risk capital.

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# Special Challenges Facing Cooperatives

## (Lessons from History)

Cooperatives face the same challenges as any other business. In addition, however, a cooperative is presented with special challenges because of its unique character as a user-owned, user-controlled, user-benefit business. These arise in marketing, finance and decision-making.

### Challenges in Marketing

Any business, investor-owned or cooperative, must consistently meet market demands for timeliness and product quality. The end product of botanicals business, for example, clearly depends on the quality and reliability of the fresh herbs delivered to the cooperative processor. For this reason, the price differences paid for quantity and quality at the market level must be reflected in the prices paid to members as they deliver their product. This is as true in fruit and vegetable or livestock marketing as it is in hardwood or special forest product marketing.

The challenge associated with this reality is that management of the cooperative is bound to enforce and compensate for quality differentials with member-owners of the cooperative. If members decide to challenge the responsibility of the manager to define and enforce price differentials based on quality, they threaten the competitive position of the cooperative. It must be recognized and resolved at the outset that the manager has the authority and will enforce differentials.

In contrast to pressuring their own cooperative to overpay them, members have also been known to undercut their own price by selling outside of their cooperative. This situation can and should be avoided by requiring marketing agreements which project the volume to be delivered by each member.

### Challenges in Finance

Cooperatives are not designed to draw risk capital. They are designed to reward use. In a forest product cooperative, earnings will be distributed in proportion to the value of product delivered and not in proportion to equity investment. Therefore, no one is directly rewarded for providing equity. For this reason, members must understand that they own the cooperative, that equity must be provided, and that in the long-term, only members will provide equity. Education in cooperative finance is important to help members understand their role in keeping the cooperative adequately capitalized.

### Challenges in Decision-Making

Member-owners control their cooperative through the board of directors. The Board sets policies and hires management to carry out the day-to-day operations of the cooperative. It is possible for members to significantly slow decision-making in the cooperative and make it unresponsive to market opportunities if they do not delegate authority.

To address this challenge, members are best advised to learn and take seriously the role and responsibilities of their Board of Directors and of management. They must hire competent management and to allow it to operate within strategic plans developed jointly with the Board.

### **Case Study:**

#### **A Network-Building Association for Wood Products Firms**

**WoodNet**  
127 East First St., Suite 4W  
Port Angeles, WA 98362

Washington's Olympic Peninsula is home to the spotted owl and other endangered species. Pinched between less timber and more competition, people in the region's premier industry, wood products, worry that they may themselves be a vanishing breed. With help from a grant from the Northwest Area Foundation, WoodNet was created to bring strategic help to Peninsula wood products firms.

#### **Targeting, group formation**

WoodNet organizers believed that, if the small nonprofit was to make a tangible difference in its three-county area, firms would have to be reached in groups. Business owners favored head-to-head competition and blamed their difficult situation on federal regulation. They were in no mood to trust outside "experts" preaching cooperation. As Gus Kostopulos, who was hired to direct the effort, set out to make WoodNet work from the bottom-up, he held fast to three principles: target wood products firms; respond to their expressed needs; and, wherever possible, work with groups of businesses.

#### **Timely, responsive, free help**

Kostopulos introduced WoodNet to firms all over the Peninsula, and asked about critical needs. He then attempted to respond with some unexpected help, however modest – a log or two for a boat

builder, a possible market for a mill's by-products. By "underpromising and overdelivering," WoodNet gained credibility. Producers began to look toward the organization for ideas, and to offer ideas of their own. The membership roll grew.

#### **A "dating" service**

WoodNet arranged for business owners to tour each other's shops. Managers who had been neighbors for years, often found that one made (or could make) what the other needed. WoodNet also helps establish regular meetings of firms with similar products and markets. Groups of artisans, remanufacturing firms, cabinet makers, and others were formed, and these became active forums for business ideas.

#### **WoodNet's strategy seems to be working**

In a few short months, the group has emerged as a member-driven association, a clearinghouse for business leads, and a conduit for technical and financial assistance. Says Kostopulos, "Many of these people once firmly believed that the only way to succeed was through strict adherence to a code of fierce competition against their neighbors. These same individuals now routinely communicate with each other and often enter into flexible relationships. WoodNet's members have marketing opportunities they never would have discovered. Products that never would have been developed are in production and are being sold. And people who never would have met are now doing business together regularly."

Excerpted with permission from the Northwest Policy Center, [Communities in the Lead](#).

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# Steps in Formation

The sequence of the following steps may vary depending on circumstances, the size of the group involved and other factors such as the knowledge of organizers involved. Figure Two is a general outline of steps to be taken before the business start-up which was developed by USDA's Rural Business and Cooperative Development Service. Those wishing to start a cooperative are well advised to use experienced counsel to draft or review bylaws and articles of incorporation. This can forestall problems.

While it is relatively easy to incorporate, the greatest challenge is making a business or cooperative grow and thrive. To assure the best chance that this goal will be achieved, several basic steps must be followed. A steering committee appointed by prospective members usually oversees these steps.

## Market Study

Assess product market options, capabilities and interests of probable members and the availability of raw materials. Determine how the industry works, what final or intermediate customers want, and how their needs are met now. Seriously ask the question "How can our business meet these needs as well or better than they are currently met?"

## Business Plan

Clearly define the proposed business. What will it produce, how and for whom. Where will raw materials come from. What start-up and working capital will be required to sustain the business? What needed skills must be hired? How much capital is required to start and sustain the business? (See Appendix I for a sample business plan outline.)

## Financial Plan

How will the equity capital and debt capital be secured? What kinds of lenders have provided such loans in the past and what requirements have they asked of borrowers?

## Educating Prospective Members

Clearly explain to members what the business is, what is expected of them and how the cooperative will work.

## Level of Interest

In a preliminary meeting, secure a vote by members on their level of interest. Identify probable members.

## Appoint Committees

Appoint committees based on knowledge, leadership and business experience to fully develop the following:

- Articles and Bylaws
- Marketing Study
- Business and Marketing Plans
- Recruitment

## Organizational Meeting

Present business plan and timetable. Secure members' financial commitments, vote for directors, submit incorporation papers with registration and franchise tax fees.

## Secure Financing

Secure working capital and equipment loans. Acquire space, equipment and vehicles as needed.

## Hire Management and Start Business

**FIGURE TWO.**

**From Feasibility to Start-up**

1. Hold an exploratory meeting of interested parties. Vote on whether to continue with feasibility.
2. Select a steering committee.
3. Conduct an economic feasibility analysis.
  - a. Survey potential members to determine needs.
  - b. Conduct market analysis to identify sources of services and products.
  - c. Prepare and analyze financial projections.
  - d. Discuss the findings and vote on whether to proceed.
4. Develop a business plan based on assumptions and results of the financial analysis. Conduct a meeting to discuss the plan and vote on whether to proceed.
5. Prepare necessary legal papers to incorporate.
6. Adopt bylaws and elect a board of directors.
7. Implement the business plan.
  - a. Complete membership sign-up.
  - b. Finalize agreements to acquire capital. Finalize all other agreements such as purchasing agreements.
  - c. Hire the manager.
  - d. Acquire facilities, hire employees, and begin operating.

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# Cooperative Development Resources

Information and development assistance for cooperatives specializing in hardwoods and special forest products may be obtained from the following sources:

Center for Cooperatives  
University of California  
Davis, CA 95616  
916.752.2408

UC Forest Products Library  
1301 S. 46th Street  
Richmond, CA 94804  
510.215.4255

Forest Products Laboratory  
USDA Forest Service  
One Gifford Pinchot Drive  
Madison, WI 53705

National Association of Accountants for  
Cooperatives  
6320 Augusta Drive, Suite 8026  
Springfield, VA 22150  
703.569.3088

National Cooperative Bank  
1401 I St. NW, Suite 700  
Washington, DC 20005  
202.336.7700

National Cooperative Business Association  
1401 New York Ave. NW, Suite 1100  
Washington, D. C. 20005  
202.638.6222

Rural Business and Cooperative Development  
Service  
United States Department of Agriculture  
Ag Box 3250  
Washington, DC 20250  
202.720.7558

Sample legal forms for consumer or agricultural cooperatives may be obtained on paper and computer disk from the Center for Cooperatives.

## References

Fossum, Harold. *Communities in the Lead*. Northwest Policy Center, Washington. 1993.

Huber, Dean and McDonald, P. *California's Hardwood Resource: History and Reasons for Lack of a Sustained Hardwood Industry*. USDA Forest Service. 1992.

Nelson, Donald. *Marketing Plan for Northcoast Hardwood Lumber*. U.S. Forest Service and City of Fort Bragg. 1994.

Thomas, Margaret and D. Schumann. *Income Opportunities in Special Forest Products: Self-Help Suggestions for Rural Entrepreneurs*. USDA Forest Service, Agriculture Information Bulletin #666. 1993.





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# Appendix I

## Cooperative Business Plan Outline

Like any other small business, a cooperative business needs to be thoroughly researched and planned up-front.

### I. The Business

- A. The Industry
  - current status and prospects for the industry
  - new products and developments
  - trends influencing the industry
- B. The Cooperative
  - what business is the cooperative in?
  - what goods/services does it intend to offer?
  - who are its member/owners?
  - what is the legal form of the company?
- C. The Products or Services
  - description
    - details of goods/services offered
    - highlights or features that make them sell
  - current state of development

### II. Market Research and Analysis

- A. Overall Market Strategy
  - general marketing philosophy
  - advantages of cooperative structure
- B. Market Size and Trends
  - describe primary market area
  - geographic area to be served
  - factors affecting market growth
- C. Customers
  - targeted customers
  - basis for purchase decision: price, quality, delivery
- D. Competition
  - realistic assessment of competing products based on price, quality and service
- E. Pricing
  - how will you price your product?
  - how do your prices compare to competitors?
- F. Sales Tactics
  - describe distribution process
  - advertising and promotion plan

### III. Operating Plan - Processing and Marketing Cooperative

- A. Location
  - proximity to member-producers
  - proximity to customers
  - access to wholesalers, distributors, and transportation
  - utilities and zoning, legal considerations
- B. Facilities & Improvements
  - how and when will space and equipment be acquired?
  - what is the capacity of the new facility
  - cost and timing of purchases
- C. Strategy & Plans
  - break-even levels of production
  - approach to quality control, inventory control, and production control
- D. Labor Force
  - skills of member/producers
  - skills of co-op employees
  - training need for new employees
- E. Critical Risks
  - what could go wrong?

### IV. Financial Plan

- A. Sources and Uses of Funds Statement
  - where is the investment coming from?
  - how will the money be used?
  - do you have enough working capital?
- B. Pro Forma Cash Flow Analysis
- C. Profit and Loss Forecast
- D. Pro Forma Balance Sheets

### V. Key People

- A. Organization
  - organization chart
  - have co-op members worked together before?
  - how do member and management skills complement each other?
- B. Member/owners
  - membership criteria
  - duties and responsibilities of each member
  - individual equity investment by members
- C. Management
  - resumes of key management employees
  - state the salary paid each manager
- D. Board of Directors
  - size and composition of board
  - list proposed board members with short statement about background

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# Appendix II

## **Marketing Information for Hardwood and Special Forest Products Cooperatives: Information Resources and Selected Bibliography**

### **Information Clearinghouse for California Forest Products**

The UC Berkeley Forest Products Lab, based in Richmond, is in the process of establishing an on-site clearinghouse of information on California's hardwood resource and the forest products classified as "under-utilized." This service will extend the breadth and accessibility of the existing Forest Products Library.

Information is being gathered on the wide range of hardwood and non-lumber forest products which include forest botanicals, mushrooms, nuts, cones, seeds, weaving and dyeing materials and greenery and floral products. A growing collection of books, articles, internal technical and research reports, videos and industry-generated literature has been established. Information about particular species or processes may be accessed either through hard-copy information or via computer linkage.

For more information or access to the Information Clearinghouse, call the UC Forest Products Library at 510/215-4255. E-mail: [fpro@library.berkeley.edu](mailto:fpro@library.berkeley.edu)

### **Special Forest Products Marketing Resources: Selected Bibliography**

The following highlights some of the best current information available on hardwood special forest product markets in California. For more extensive listings, please contact the Information Clearinghouse at the UC Forest Products Lab (see column at left).

#### **Income Opportunities in Special Forest Products: Self-Help Suggestions for Rural Entrepreneurs. USDA Forest Service, Agriculture Information Bulletin #666, 1993.**

Presents thorough market, start-up and resource information for the full range of special forest products, along with profiles of successful rural businesses in each sector. This is a must-read for anybody in the industry.

#### **California's Hardwood - A Hidden Resource. Video by the UC Forest Products Lab, due out 1995.**

Aimed primarily at the secondary manufacturers, large and small scale. Topics include: California hardwoods as a manageable resource - Encouraging the best use of the resource - sustainability of the resource - quality and unique characteristics of CA hardwoods - manufacturers' needs and marketing issues - overview of products currently using CA hardwoods.

#### **Marketing Manufactured Wood Products. Catherine Mater, Mater Engineering, Ltd, 1995.**

Workshop materials - Basic marketing principles - Wood product industry - Niche opportunities - Marketing options.

#### **Marketing Plan for Northcoast Hardwood Lumber. Donald R. Nelson, for the U.S. Forest Service and City of Fort Bragg, 1994.**

Analyzes conditions for growth in the hardwood industry in Mendocino County based on industry surveys and literature review. Discusses past failures. Finds that a

Hardwood Marketing Association with strong expertise and an ability to train workers in milling, drying and marketing native hardwoods has the best potential for success in the Mendocino hardwoods industry.

**Making Wood Work:  
Value Added Policies and Programs.  
Helen Birss, Northwest Policy Center, 1993.**

Changes in forest products sector - Strengthening value-added manufacturing - New value-added industries - Programs by region - Resource materials. There is no California coverage. Otherwise, this is a useful resource, and a good model for a CA -based report.

**Communities in the Lead.  
Harold L. Fossum, Northwest Policy Center, 1993.**

Identifies resources and successful approaches to capacity building in rural communities, with a focus on value added enterprise development for the natural resource industries.

**California Forest Products Marketing Directory.  
CA Department of Forestry and Fire Protection, 1992.**

Comprehensive listing of California's forest products industry, based on surveys and research.

**Feasibility of Marketing California Black Oak Lumber through a Cooperative. Charles V. Moore, Center for Cooperatives, UC Davis, 1992.**

Feasibility analysis for siting a black oak processing cooperative in Auburn, CA. Market analysis and proposed cooperative structure.

**California's Hardwood Resource: History and Reasons for Lack of a Sustained Hardwood Industry. Dean W. Huber and Philip McDonald, USDA Forest Service, 1992.**

Hundred year survey of hardwood opportunities and failures. Analysis of problems, and conclusion that current conditions are good for a renewed industry.

**Revitalizing Timber Dependent Regions of Washington. Paul Sommers and Helen Birss. Northwest Policy Center, 1991.**

Economic and social impact of harvest reductions - Statewide and regional wood products surveys - Policy options for revitalizing timber-dependent regions of Washington.

**Hardwood Resource Assessment and Management. George L. McCaskell, Sierra Economic Development District, 1990.**

Feasibility of developing a hardwood industry in Amador, El Dorado, Placer, Nevada and Sierra Counties. Problems in the CA hardwood industry - Quantity and quality by species in the region - Management techniques - Grading system - Marketing study.

**High Sierra Resource Conservation Development Area, Hardwoods Directory: Producers to Users. High Sierra RC&D Council, 1990.**

Developed to promote the use of local hardwoods in the High Sierra RC&D area, including Amador, El Dorado, Nevada, San Joaquin, Sutter and Yuba Counties. Targeted population includes foresters, loggers, sawmill operators and remanufacturers, wholesalers and retailers, and woodworkers.

**Status of the Hardwoods Resource of California: A report to the Board of Forestry. Kenneth E. Mayer et al. 1986.**

Reviews CA hardwoods management and planning issues - studies underway - policies of regulatory agencies.

**Woodworkers' Network, PO Box 390670, Mountain View, CA 94039.**

Monthly newsletter for and about woodworkers. One-year subscription is \$19. Information on trade shows, workshops and suppliers - producer features - event listings - special opportunities.

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# Appendix III

## Lending Resources in Rural Cooperative Development

### Keys to Success

Like any other new business, start-up cooperative businesses must demonstrate strong potential to generate cash-flow and repay their loans. National Cooperative Bank Development Corporation describes what lenders are looking for this way:

- Cooperative business owners who demonstrate they've identified a market niche and secured the human and financial resources to take advantage of it.
- Professional management that is experienced and tested and can provide ongoing leadership training.
- Owners willing to put their own capital at risk.
- A business plan that reflects a sound financial plan and a realistic timetable.
- The entrepreneurial spirit necessary to a new venture.

### Equity Requirements

Regardless of the lender, entrepreneurs are expected to invest their own risk capital in a new business. Generally, a 25% equity investment is required.

### Loan Guarantee Programs

The public sector offers loan guarantee programs to encourage commercial banks to make loans for small business development. Loan guarantee programs are available through:

- U.S. Small Business Administration (to \$500,000)
- USDA's Rural Economic Development and Community Services, formerly Farmers Home Administration (to \$10 million)
- California's State Loan Guarantee Program (to \$350,000)

### **Micro-enterprise and Community Lending Programs**

Special lending programs are available from public and nonprofit lenders whose goal is to support small business development and job creation in low-income communities. The loans are intended for businesses which do not otherwise qualify for bank loans. Low-interest loans are available under some programs. Special lenders include:

- CA Trade & Commerce Agency, Old Growth Diversification Revolving Loan Fund (up to \$100,000 for business start-up and expansion to create jobs in Option 9 counties)
- Northern California Community Loan Fund
- U.S. Small Business Administration, micro-lending program (to \$25,000)
- Local community development corporations and entrepreneurship programs like Arcata Economic Development Corporation and West Company (Ukiah)
- CA Dept. of Housing and Community Development, CDBG program (to \$500,000)

### **Commercial Banks**

Commercial banks are required to lend in under-financed regions within their service area under the federal Community Reinvestment Act. Large banks often have community lending programs or development banks which specialize in making loans they consider too risky to qualify for standard lending programs. Start-up cooperatives may qualify for financing through supportive local banks or:

- National Cooperative Bank Development Corporation, Washington D.C.
- Saint Paul Bank for Cooperatives, MN

# Appendix IV

## Quality Processing of California's Hardwoods

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University of California Forest Products Laboratory  
1301 South 46th Street  
Richmond, CA 94804

Presented at:  
Cooperative Opportunities in Processing and Marketing Hardwoods  
and Special Forest Products  
May 1995

A Series of Workshops Sponsored by:  
The Center for Cooperatives, UC Davis  
Davis, CA 95616

California has a vast forest resource, second in the nation only to Alaska. The softwood forest products industry has historically been the major component of the Northern California economy. Although there is also a sizable hardwood component to California's forests, the native hardwoods never played a key role. As we move into the 21st century, societal pressures are causing a reevaluation of our natural resources with an emphasis on sustainable production and improving rural economies. In certain situations hardwoods may be a viable resource for local needs, specialty products, or perhaps even supply a larger commodity market. Local products made by artisans, woodworkers and hobbyists prove that high value products can be made. In fact, value-added products can be produced from any type of wood, but special manufacturing techniques and innovative marketing strategies may be required to do it economically.

The desire for increased utilization must be balanced with the valid concerns for wildlife needs and the poor regeneration and inherent slow-growth of many of the native hardwood species. In some cases, these concerns may result in the inability to maintain sustainable

processing. This paper summarizes the available information and offers guidelines that can help assess the economic potential and sustainability of utilizing hardwoods.

### **TABLE ONE.**

#### **Some Native Hardwoods of California Timberlands**

Alder	<i>Alnus rubra</i>
Bigleaf Maple	<i>Acer macrophyllum</i>
Buckeye	<i>Aesculus californica</i>
California Black Oak	<i>Quercus kelloggii</i>
California Laurel	<i>Umbellularia californica</i> (bay laurel, myrtlewood, pepperwood)
Chinkapin	<i>Castanopsis chrysophylla</i>
Madrone	<i>Arbutus menziesii</i>
Oregon White Oak	<i>Quercus garryana</i>
Tanoak	<i>Lithocarpus densiflora</i>

Before focusing on the quality of a manufactured product it is important to understand the limits of the raw material and the manufacturing processes, and the expectations and demands of the market. These are common concerns for all types of business structures (small business,



cooperative, large company). When dealing with the hardwood resource of California, the properties and characteristics of the raw material place certain limitations on the type and quality of products that can be produced. Manufacturing techniques also play an important role in product quality.

## Character of the Resource

The diverse range of climatic and geologic conditions in California result in a diversity of tree species and great variation in properties within species. The California hardwood resource can be grouped into the three major categories of woodland, timberland, and urban environments. Although there is some overlap, these groups also tend to define species groupings. The woodland hardwoods are found in the lower elevations and foothills. These trees often grow in low density stands or open lands resulting in a spreading tree form with a lot of branching. Timberland hardwoods are found in the dense, mixed hardwood/conifer forests of California's higher elevations resulting in trees with less branching and smaller crowns. The hardwoods of the urban environment include a wide range of species, both indigenous (timberland and woodland species) and exotic species; and a wide range of tree form, from spreading, highly branched park trees to heavily pruned street trees. All of these trees can be a valuable wood resource, however some are better suited for certain products than others.

**TABLE TWO.**

### Some Native Hardwoods Of California's Woodlands

Red Oaks	
Coast Live Oak	<i>Quercus agrifolia</i>
Interior Live oak	<i>Quercus wislizeni</i>
Canyon Live Oak	<i>Quercus chrysolepis</i>
White Oaks	
Engelman Oak	<i>Quercus engelmanni</i>
Blue oak	<i>Quercus douglasi</i>
California White Oak	<i>Quercus lobata</i>
Western Sycamore	<i>Platanus racemosa</i>
Cottonwood and aspen	<i>Populus sp.</i>

## Appearance Properties

The properties of many of the timberland species are fairly well known. Less is known about the woodland and urban species, however, some general comments about the properties can be made on the basis of tree form. Most hardwoods are manufactured into finished products which highlight appearance. This means that in addition to machinability, the appearance characteristics such as color, texture, figure and how well the wood finishes are also important considerations. The relative importance of these properties is dependent on the specific requirements of the finished product.

**TABLE THREE.**

### Important Appearance Characteristics Of Selected Hardwoods

	Machinability	Texture	Color
Madrone	10 (best)	fine	variable, reddish
Red Alder	8	fine	uniform, lt. brown
OR White Oak	8	fine	uniform, cream
CA Black Oak	7	med.	uniform, md. brown
Eastern Red Oak	7	med.	uniform, golden
Tanoak	7	med.	variable, gold/brown
CA Laurel	6	med.	uniform, cream
Chinkapin	6	med.	uniform, lt brown
CA Black Walnut	6	fine	uniform, drk brown
Cottonwood	4 (poorest)	coarse	uniform, gray brown

Often a positive characteristic for one product can be a negative characteristic in another. For example, the variable color in Madrone or the high figure of California Black Walnut may be highly desirable in a piece of custom made furniture but undesirable in a mass produced furniture or cabinet line where a uniform appearance is expected.

Most of the California hardwoods yield a high quality surface when machined with woodworking tools. In Table Three, a relative ranking from 1 (unacceptable) to 10 (excellent) is assigned to the machinability of some California hardwoods after planing and shaping. Of the woods tested, most resulted in a surface quality comparable to that of Eastern Red Oak. The fine textured, high density woods such as Madrone and Oregon White Oak are exceptional in machinability. Machining studies have not been performed on most woodland species. It is expected that the higher density, fine textured woodland oaks (live oaks and CA white oak) will machine fairly well, however the higher frequency of knots and grain deviations in these woodland species may result in a higher percentage of surface defects than found in timberland species.

### Important Physical and Mechanical Properties

For most hardwood uses, mechanical properties such as strength and stiffness are not very important, unless they are used for structural purposes. The range of density found in most California hardwoods, from moderate to high density, means they have

acceptable mechanical properties for most uses. However, for specialized uses, such as hardwood flooring where hardness is important, it is necessary to consider mechanical properties. Knowledge of physical properties provides a basis for predicting how wood will dry and how it will perform in service. Density is a good predictor of ease of drying. Dimensional change, in response to changes in wood moisture content (shrinking and swelling) is a good predictor of the potential for warp. Properties for some hardwoods are listed in Table Four.

The higher density woods (.5 g/cm<sup>3</sup> or greater at 12 % MC) are generally more difficult to dry and less dimensionally stable than woods with a density less than .5 g/cm<sup>3</sup>. Dimensional instability, as defined in the table below, is the ratio of the total shrinkage values (dried to an oven dry condition) in the direction tangent to the growth rings, relative to that in the direction radial to the growth rings. Woods with a dimensional instability ratio greater than 2 are considered warp prone. This does not mean that high density woods with high dimensional instability ratio can not be valuable lumber species. It simply means that greater care is required in the drying process.

**TABLE FOUR.**

#### Important Physical and Mechanical Properties of Selected Hardwoods

	Density (at 12% MC)	Hardness	Tangential Shrinkage	Dimensional Instability
Cottonwood	.38 g/m <sup>3</sup>	390 lbs.	8.6%	2.4
Red Alder	.43	620	7.3	1.7
Chinkapin	.50	780	7.4	1.6
CA Laurel	.62	1460	8.1	2.9
CA Black Oak	.5+	1080	7.8	2.1
CA White oak	.68	1570	9.8	2.4
OR White Oak	.74	1780	9.0	2.1
Madrone	.68	1530	13.7	2.4
Tanoak	.67	1450	12.0	1.9

The ratio of tangential to radial shrinkage is not the only cause of warp. Variation in the direction of the grain within a board (grain deviation) is also a primary factor. Grain deviations can be growth related spiral or interlocked grain, such as that found in many Eucalyptus trees; a result of the sawing method, especially in crooked logs; or, due to the presence of knots. The high degree of grain deviations expected in woodland or urban trees suggests that lumber cut from them would have a tendency to warp.

## Potential Products and Markets

Based on the physical and mechanical properties, any of the common hardwood consumer goods could be manufactured from California hardwoods. Obviously, some woods are better suited for particular products than other woods. Also factors such as resource availability, cost of production, and quality of the end product are important in determining the long term viability of a business venture.

Lumber produced from California hardwoods can be used to manufacture products in the following four categories:

- Furniture
- Flooring
- Cabinetry
- Miscellaneous — architectural trim, picture frames, toys, etc.

Within each of these categories there is a commodity market and a niche market. The commodity market demands large volumes of lumber, readily available at a competitive price and manufactured to existing industry standards. In contrast, the niche market is more flexible because a specific product or customer is targeted and the product is tailored to the customers needs.

In addition to the classic commodity and niche markets, the emerging market of "environmentally friendly products" has real potential for California's hardwoods. Recent surveys indicate that consumers would like to

be able to buy products made from wood obtained from sustainably managed forests that are sensitive to environmental concerns. However, the message is mixed; it is not clear if consumers are willing to pay more for these products. In California, there are at least two organizations with certification programs for "environmentally friendly" wood products: Scientific Certification Systems in Oakland, CA and the Institute for Sustainable Forestry in Redway, CA.

### Furniture

The retail furniture market is expected to continually grow along the west coast because the region has a higher than average per capita income, a continually strong metropolitan growth and an increasing growth of the 35 - 44 age category which is the segment of population that buys the most furniture. Furniture exports to Canada and Mexico are also expected to rise as a result of the 1994 North American Free Trade Agreement (NAFTA).

**Commodity market** — Based on the volume of the resource required in a commodity market the most promising species are Tanoak, Madrone, California Black Oak and perhaps California Laurel. The inherent color variation in Tanoak and Madrone will be major obstacles to acceptance in a commodity market.

**Niche market** — With the exception of the lower density woods with poor machining characteristics (e.g. cottonwood), all of the California hardwoods have a niche potential in the production of custom or specialized furniture. The unique character and color variation can be marketed as positive traits.

### Flooring

California is the leading region in the growing hardwood flooring market with 14% of national sales. The primary requirement for hardwoods used in flooring is that they be able to resist mechanical damage such as scratches and dents; the hardness property (the force required to imbed a steel ball into wood) is a good indicator of this ability. Generally, a

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hardness above 1,000 lbs is required for a satisfactory hardwood floor. All of the high density California hardwoods (density above .49 g/cm<sup>3</sup>) are acceptable.

**Commodity market** — The most promising California species for the hardwood flooring market are Tanoak, Madrone, and California Black Oak.

**Niche market** — In addition to Tanoak, Madrone, and California Black Oak the other high density hardwoods such as Oregon Oak, California White Oak, California Laurel, and the live oaks are excellent candidates for the niche flooring market.

### **Cabinetry**

About 70% of the cabinet market is a result of the repair and remolding of existing kitchens, which is expected to be a continually growing market. The preferred wood for kitchen cabinets are the light-colored hardwoods, such as oak and maple.

**Commodity market** — The most promising California species for the cabinet market are California Black Oak and perhaps Tanoak.

**Niche market** — With the exception of the lower density woods with poor machining characteristics (e.g. cottonwood), all of the California hardwoods have a niche potential in the production of custom cabinets. The unique character and color variation can be marketed as positive traits.

### **Miscellaneous**

This is generally considered a niche market. With the exception of the lower density woods with poor machining characteristics (e.g. cottonwood), all of the California hardwoods have potential for artistic and custom made products. Often the unique character and color variation of woods such as Madrone and California Black Walnut are preferred traits.

## **Manufacturing Techniques and Quality Control**

Quality should be a prime consideration every step of the way, from harvesting the tree to drying the lumber. The high density California hardwoods present definite manufacturing challenges. However, there are techniques that can be followed to minimize the problems and maximize the quality of the lumber produced. The following discussion refers specifically to the manufacture of high value uses but many of the same ideas can be applied to the lower value uses.

### **Processing Recommendations**

The hardwood industry in the United States developed around the large diameter, high quality trees of the Northeast and a minimum log length of 8 feet. The decreasing quality of the available resource has led to new innovations in processing aimed at maximizing quality lumber production from small diameter, low grade trees. A basic knowledge of wood behavior and processing techniques are important tools to minimize the problems associated with lumber production from high density California hardwoods. Processing lumber can be considered as three steps: harvesting, sawing, and drying.

**Harvesting** — It is important to recognize the utilization potential of trees before they are cut. Some trees will have very little potential and should be left in the forest or removed as firewood or other low value product. Of the trees that are selected for removal to be processed as lumber, it is important to cut log lengths that maximize the highest quality lumber. This means cutting to lengths that maximize straight grain and minimize the presence of knots or other defects such as decay or insect damage. For California hardwoods this often means short log lengths of 6', or if your sawmill can handle it, even 4'.

**Sawing** — The goal of any sawmilling operation should be to produce the greatest number (maximum yield) of uniformly thick,

high quality boards possible in each log. To maximize yield it is important to carefully select a rough/green thickness and to remove as little as possible when squaring up the round log. The rough/green thickness must take into account the amount of thickness reduction due to planing (about 3/16") and the loss to shrinkage when the board is dried (about 5%). As an example, to produce a surfaced, 1" thick, kiln dried board the rough/green thickness should be 1.25" (.19" planing allowance + .06" shrinkage allowance). To maximize quality, it is helpful to visualize how the boards can be cut from a log before sawing it into lumber. In most cases, the highest quality boards will be obtained by positioning the log so that the knots are positioned on the edges of a board so that they can be removed by edging the lumber.

**Drying** — California hardwoods have a reputation for being hard to dry. However with the proper care good results can be obtained. Knowledge of physical properties provides a basis for predicting how wood will dry and how it will perform in service. Density is a good predictor of ease of drying and dimensional change in response to changes in wood moisture content is a good predictor of the potential for warp. The higher density woods (.5 g/cm<sup>3</sup> or greater at 12 % MC) are generally more difficult to dry and less dimensionally stable than woods with a lower density (less than .5 g/cm<sup>3</sup>).

Most of the problems encountered in drying are related to stresses that develop during drying. The stresses that cause lumber to warp are a direct result of the differential shrinkage in wood between the tangential (tangent to the growth rings) and radial directions (parallel to the rays) Variation in the direction of the grain within a board (grain deviation) is a contributing factor. These grain deviations can be growth related, such as spiral or interlocked grain (common in many Eucalyptus trees); a result of the sawing method, especially in crooked logs; or, due to the presence of knots. The high degree of grain deviations found in many California hardwoods suggests that lumber cut from them would have a tendency to warp; an assumption verified by experience. Warp can

be minimized by drying lumber in thicker dimensions or placing restraint on the boards to keep them flat during drying. A method known as Saw-Dry-Rip takes advantage of the inherent resistance to warp in thicker dimensions by drying 4" or thicker flitches and cants and then resawing them to final sizes. The disadvantage of this technique is that it lengthens the time to dry the lumber and it increases the chance of developing other drying defects such as collapse, honeycomb, and casehardening. If time is not a concern, this method has great potential for producing high quality lumber. However, if time is an important consideration in the optimization of the drying process, the risk to create other drying defects is too great in the higher density California hardwood species.

Collapse, honeycomb and casehardening are drying defects that occur because stresses are created inside wood as the water leaves and the wood shrinks. Although these defects are not apparent until the wood is nearly dry, they actually begin developing very early in drying. This critical stage is from the initial green moisture content down to about 25%. Once the average moisture content reaches about 25%, then more severe drying conditions can be used safely.

With a knowledge of drying principles and adequate control over the drying conditions, quality dry lumber can be produced with any drying method. If long drying times are not a concern, air drying can be an effective method for the critical drying stage. But even in an air yard the drying conditions can be too severe. Avoiding direct sun exposure on the wood and positioning lumber stacks (relative to wind direction) to increase or decrease the amount of air that passes through the lumber stack are ways to gain some control over nature's drying conditions. Ideally, the drying method should be capable of drying wood to 8% MC, achieving a temperature of 160 F (the temperature required to sterilize insect-infested wood), and having a method to reintroduce moisture at the end of drying so that casehardened lumber can be conditioned to relieve the drying stresses. A kiln is needed to accomplish these goals.

A solar kiln is the least expensive kiln method but it is difficult to achieve 160 F and to condition the lumber without auxiliary equipment. A dehumidification kiln is generally less expensive than a steam-heated kiln, unless an inexpensive steam source is available. Some dehumidification units have a maximum operating temperature of only 120 F but units are available that can reach 160 F. A small steam generator should be added to a dehumidification kiln in order to condition the lumber and minimize the problem of casehardened lumber. A steam-heated kiln gives you the most control over the drying conditions but it is also the most expensive unit to purchase.

### Summary

California hardwoods present some manufacturing challenges. The unique characteristics of California hardwoods often require specialized manufacturing techniques and extra care, especially during drying. The technology exists to address these challenges, and with an understanding of some of the fundamental wood properties and basic manufacturing principles, many of these hardwoods can be manufactured into high value products.

A successful California hardwood enterprise must profitably produce a consistent quality product for the target market. For most native California hardwoods targeted to niche or specialty markets this usually means a definition of product quality needs to be created. But the principle of quality control is the same for niche products as it is for commodity products. Once quality is defined, in terms of moisture content, size tolerances, surface quality, etc., a method of measuring quality parameters during production is necessary to ensure quality.

Meeting the manufacturing and marketing challenges is no trivial task but there is now more interest than ever in better utilization of the native hardwood resource of California. The resource exists, we know how to work with it, and high-value products can be made from it. It is now a matter of putting all the pieces of the puzzle together.

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