

# So You Want to Build A Sawmill

By  
**John M. Higgs**, Forester  
USDA Forest Service, Washington, DC

Revised April 2002 by  
**Terry Mace**, Forest Products Utilization Specialist  
Wisconsin DNR Division of Forestry, Madison, Wisconsin

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## Preliminary Planning for a Successful Sawmill

Simply stated, a successful sawmill employs the right people and the proper equipment to convert the available timber into a product sought by the market. This statement is much easier to make than it is to carry out. To anyone seriously investigating the feasibility and implementation of a sawmilling idea, the complexity of that task quickly becomes monumental. Each phase—envision, plan, design, build, staff, operate, market, and maintain—is difficult, unique, and challenging.

Sawmilling has been compared to juggling. There is a need to constantly balance a log inventory with the demands of the market. A sawmill has little control over its log resource. Mother Nature grew it, and generally what is delivered is what is bought. This lack of control extends to the market. Orders can't be taken for products no one needs. A sawmiller caught between these two variables (resource and market), over which he/she exercises little control, has only the flexibility anticipated, planned for, and designed into the mill to rely upon for economic survival.

The word “anticipated” is the key to the idea to be presented in the following outline. The objective of the outline is to provide a guide for investigating the reality of resource and market as they dictate their needs to a sawmill planner. The better the anticipation, the better the ability of the mill to “juggle” and, consequently, the better the chance for economic survival of the sawmill.

Some simple logic serves well the need to build the “right” mill. You need to know all you can about the timber you have available for manufacture and the markets in which you hope to sell. Until a thorough investigation of both of these topics has been made, the plan, design, and selection of a sawmill location, layout, and equipment will be the proverbial “shot in the dark.” As simple as this idea is, many mills have closed or undergone costly rebuilding because of unrecognized features related to logs or markets.

## I. The Timber Resource

### A. What will it look like?

1. Species (how much of which)
2. Quantity (how much of which)
3. Quality (how much of which)
4. Stem lengths
5. Log lengths
6. Taper factor
7. Form (sweep, butt swell, pistol butt, etc.)
8. Diameters (small and large end)
9. Soundness (rot, peck, shake, etc.)
10. Special considerations (tendency to stain, worm, etc.)

### B. Where will it come from?

1. Distances (circle of supply)
2. Terrain (year-round, cost to log; i.e., logging chance)
3. Ownership (large, small, Federal, State, private, etc.)
4. Competitive alternatives (veneer, paper, firewood, etc.)
5. Accessibility (weather, soil, drainage, etc.)
6. Availability (year-round, inventory needs, fire)
7. Transportation (road, rail, water, etc.)

### C. What will it cost?

1. Standing
2. Delivered
3. Logging costs
4. Land use alternatives
5. Fees, permits, etc.

### D. How much will the characteristics of the resource change over time?

1. Species (how much of which)
2. Quantity (how much of which)
3. Quality (how much of which)
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10. Special considerations (tendency to stain, worm, etc.)
11. Distance (circle of supply)
12. Terrain (year-round, cost to log; i.e., logging chance)
13. Ownership (large, small, federal, state, private, etc.)
14. Competitive alternatives (veneer, paper, firewood, etc.)
15. Accessibility (weather, soil, drainage, etc.)
16. Availability (year-round, inventory needs, fire, etc.)
17. Transportation (road, rail, water, etc.)

### E. Does the timber availability match the economic life of the plant?

## II. The Market

- A. What about income?
  - 1. Current prices allow for what range of profit?
  - 2. Entry of an additional mill's product will have what effect on prices from a supply/demand point of view?
- B. What will markets look like?
  - 1. Species (how much of what)
  - 2. Products (sizes)
  - 3. Customers (how many per product)
  - 4. Quantity (how much per customer)
  - 5. Quality (specifications, percentages, etc.)
  - 6. Package
  - 7. Competitive alternatives (new products, new uses)
- C. Where are the markets located?
  - 1. Distances (circle of supply)
  - 2. Transportation (road, rail, water)
  - 3. Accessibility (personal, phone, remote sales)
- D. How much will the characteristics of the market change over time?
- E. How long can the market and its components (customers, products, etc.) be expected to last?
- F. Is there a potential for new products and/or markets?

A tie mill can't take advantage of an order for long timbers. High-grade logs are wasted in a scragg mill. Marketing 2 by 10s to a major stud buyer is difficult. As true as these statements may be, their impact still sometimes occurs after the mill is built and into operation. A successful sawmiller will find few surprises either in the woods or in the marketplace. The information necessary to design a successful mill is available if you know how important it is when you find it. If you find it before the mill is planned, that information helps in the planning and is some insurance for future success. If you wait to find resource and market information until after the mill is built, you have passed up an opportunity for efficient planning and have jeopardized the mill's opportunity for success.

### **Questions for Consideration in Establishing a Sawmill**

The lure of sawmilling has always been strong. Many farmers, loggers, millwrights, or woodworkers have "slipped" into sawmilling almost by accident. As logical and easy as this entry appears to be, establishing a sawmill is a major undertaking. A modern sawmill, regardless of size, is a complex interaction of resource, manufacturing, and market input. The following outline is meant to serve as a guide for the development of an organized sawmill plan. Successful sawmills do not just happen!

The following list of considerations is designed around a series of questions. These questions are arranged in a particular sequence. Ideally, the answer to each question should be positive. Each "no" answer indicates a potential problem. Each "I do not know" answer indicates the need for more information. The greater the number of "no" and "I do not know" answers, the greater the difficulty in establishing, operating, and maintaining the sawmill under consideration.

## I. Preliminary Considerations

### A. Timber resource characteristics

1. Does a timber resource base exist to realistically supply (access, price, etc.) the logs required by species, size, quality, and quantity to match the production level and life of the mill?
2. Will the impact of the mill on human, plant, and animal communities be acceptable to the surrounding population?

### B. Market characteristics

1. Does a market exist for the mill's products at the projected production level for the life of the mill?
2. Can such a market be developed and maintained?
3. Can mill residue be marketed?
4. Can nonmarketed residue be disposed of in an economically and environmentally acceptable manner?

### C. Facility characteristics

1. Has a particular mix of product alternatives been selected?
2. Has a particular size been chosen for the mill's physical and production capacity?
3. Is there an available energy source capable of economically meeting the mill's needs?
4. Has a particular level of production been selected?
5. Has a particular schedule for use of the facility been selected?
6. Have the characteristics of the facility been matched to the characteristics of the timber resource (i.e., quantity, quality, size, shape, etc.) not only for the present but also for the future, recognizing any potential change in the characteristics of the log resource?

### D. Regulatory considerations

1. Have Federal, State, and local laws and regulations relating to such concerns as worker's compensation, fees, taxes, registration, zoning safety, and the environment all been identified and found to be compatible with the proposed enterprise?
2. Do past uses present any regulation issues?

## II. Logistical Considerations

### A. Location, permanent or temporary, as mill type indicates

1. Is a site available that supplies the mill's need for space?
2. Is the site an acceptable distance to the timber resource?
3. Is the site an acceptable distance to the marketplace?
4. Is the site an acceptable distance from residential neighborhoods?

### B. Personnel

1. Is there an available supply of trained and/or trainable personnel to operate the mill?
2. If not, can such a supply be developed?
3. Can a labor force be adequately compensated by the mill at a support level free from economic hardship to avoid high turnover and general dissatisfaction?

### III. Design Characteristics

#### A. Equipment type

1. Do production level and product mix decisions (how much of what) provide the information necessary to choose between a stationary and a portable mill?
2. Do production level and product mix decisions (how much of what) provide the information necessary to choose between a circular or band head rig?
3. Do production level and product mix decisions (how much of what) provide the information necessary to determine the need for and selection of secondary breakdown machines (resaws, edgers, trimsaws, etc.)?

#### B. Site layout, permanent or temporary, as the mill type indicates

1. Are the physical characteristics of the site, such as soil type, drainage, slope, etc., compatible with the proposed mill?
2. Is the site large enough for both current and future projects?
3. Is community support available in such areas as security, local transportation, housing, and social services?
4. Is there convenient access for both resource and personnel?
5. Is there local support in the community for the business?

#### C. Mill layout

1. Will log size, manufacturing priority, product mix, and/or personnel require flexibility in the selection of machines, their arrangement, flow, and “in process” storage?
2. Will personnel or technical support provide information required to choose external (outside storage, movement, and flow) transportation alternatives for the mill?
3. Will production maintenance schedules require storage or surge areas within the mill?
4. Will associated equipment; e.g., guide lights, laser lights, safety and comfort facilities, etc., be available?
5. Is the mill designed to operate in the safest manner possible?

### IV. Establishment Consideration

#### A. Scheduling

1. Is the total time required from planning through startup available and acceptable?
2. Have stages for start and completion of each phase of development been established and accepted?
3. Have these stages been arranged in their desired order of completion?
4. Has the flexibility for such variables as weather, permits, delivery time, etc., been recognized?

#### B. Funding—Is the necessary capital available to support the following until such time as generated revenue can support operating costs?

1. Purchase
2. Construction
3. Installation
4. Staffing
5. Stocking
6. Startup
7. Initial operation (working capital)
8. General overhead
9. Debt service

- C. Management staffing—Are skilled supervisory personnel available to oversee the establishment phase of the mill?
- D. Support services and personnel—Are the services, personnel, and equipment necessary to construct the facility and install equipment available?
- E. Recruitment and operation staffing—Is there a realistic program for the recruitment and training of the personnel necessary to operate the entire enterprise (from procurement through sales)?

#### V. Operations Considerations

- A. Communications—Will both a network and environment exist to ensure free, two-way, and efficient communication, both between and within all departments and their personnel?
- B. Responsibility—Will a clear and realistic assignment of decision-making duties (job descriptions) for all functions within the mill be determined, maintained, and enforced?
- C. Authority—Will a clear and realistic assignment of decision-making duties for all function be binding on all personnel and facilities involved?
- D. Production standards—Will a realistic level of performance (quotas, rates, etc.) for each unit of input, production, and output be determined and maintained in such a way as to promote accomplishment (bonuses, awards, etc.)?
- E. Evaluation
  - 1. Will a realistic, positive, and nondivisive mechanism to evaluate all performance standards and levels be developed, applied, and maintained too not only monitor, but promote performance?
  - 2. Will each unit of input yield a particular quantity that can be measured with a range of acceptable performance?
  - 3. Will each job identity, while performing at an acceptable level, yield a particular quantity, quality or level of production?
  - 4. Will each machine, machine center, and structural facility, while performing at an acceptable level of production, yield a particular quantity, quality, and/ or level of production?

#### VI. Maintenance Considerations

- A. Commitment
  - 1. Has management made a commitment to the maintenance of the facility and its equipment equal to its commitment to production levels and / or profit?
  - 2. Is this commitment to active (preventive) rather than passive (reactive) maintenance?
- B. Support—Will equipment, personnel, and facilities (parts, access, etc.) be available to ensure an efficient maintenance effort?
- C. Scheduling—Will the overall production quotas and schedules allow for, and be compatible with, the scheduled maintenance program?
- D. Recordkeeping
  - 1. Has a complete file on the facilities, equipment, suppliers, and performance standards been developed?
  - 2. Will files become the bases of maintenance, scheduling, and records throughout the life of the mill?
  - 3. Will these files be kept up to date?

## Conclusion

By tradition, sawmilling, especially in small mills, has been looked upon as a simple, uncomplicated business. The multiple interests and skills that tend to lend themselves to the thinking that a sawmill is an obvious extension of some other activity and is easily done compound this attitude. It is often thought that any good mechanic or engineer could build, operate, and maintain a sawmill simply by keeping machines operating. This tendency to underestimate the intricacy of a successful sawmill is compounded by the urge to hurry production. Many sawmills have seen their first logs yarded before the mill foundation was laid or lumber put on sticks before the first sales call was made. The consequences of these ideas often undo the best intentions and highest hopes.

Establishing a sawmill is a major undertaking, demanding the best organization planning available. Because all sawmills are different, few plans would be identical. Common to all plans, however, should be elements addressed by the questions presented here. It is hoped that your answers will be a valuable guide in considering the alternatives in establishing a sawmill.

