LOG SORTYARDS
and
Other Marketing Systems

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Background

Using log sortyards to improve resource utilization and increase profitability is not a new idea, but it is experiencing a renaissance of sorts, particularly in the Pacific Northwest and Northern Rockies, for several reasons:

1. Fewer large diameter trees are being harvested.
2. Smaller diameter materials make up a greater percentage of total timber harvests than in the past.
3. Community economic diversification efforts which seek to encourage the development or expansion of local value-added wood products manufacturers have found that many of those businesses need to buy raw materials in smaller-than-truckload quantities.
4. There are increasing numbers of community-based forest stewardship projects which seek to "separate the logger from the logs" and require a mechanism other than the traditional timber sale to deal with any merchantable products generated.
5. The saleable material produced by any one stewardship contract can be of varying species, quality, and quantity.
6. Non-industrial private forest landowners who want to harvest timber and maximize the return they receive for it benefit from an easily accessible, competitive marketing system.

The potential value of log concentrating and sorting yards was recognized decades ago in the eastern and southern United States, areas with high percentages of their forest lands in private ownership. In a 1964 article, Gordon D. Lewis of the Forest Service's Southeastern Forest Experiment Station observed that:

> It is argued that log concentration yards would have many advantages over existing rough forest products markets because they would accept any quantity of all major forest products that were delivered. Economic waste would be eliminated because each tree and tree section could be put to its highest use. Furthermore, timber growers would no longer have to sell some of their trees for lower value products in order to have enough volume to interest buyers, and they would receive higher prices for their timber. For the timber operator, the concentration yard would provide a stable market for all roundwood products in large or small amounts...."[1]

A 1977 Forest Service report by Ken Kilborn looked at how a proposed agency-operated concentration yard, coupled with an expanded marketing effort, could be used in Idaho to "enable private enterprise to remove the dead and dying trees as prescribed by the Forest Service in an effective and efficient manner. The contract could focus more on the condition of the forest after the harvest than on the method of removal...."[2] The report concluded that having a private party

operate the sort yard would be even better, since the operator could also sell trees salvaged from state and private lands.

In 1981, Kilborn assessed the possible development of a log merchandising and concentration yard in the Matanuska-Susitna Borough in Alaska, and discussed industry response to the idea.

> The log merchandizing and concentration yard concept has been proposed for many areas in the lower 48. Interviews of industry personnel indicated that in general large firms were opposed to the proposal and small operators were in favor of the idea. One reason why large firms opposed [it]...is that large firms by definition were already fully integrated with specialized sawmills, veneer plants, and pulp mills. They carried out their own sorting and grading operation and were able either to use all the products in their own operations or sell to other companies.... A wholesale log market would extend to small non-integrated firms some of the benefits already achieved by large firms.
>
> The idea of a merchandizing and concentration yard has been adapted by several of the large pulp and paper industries. The Crown Zellerbach Corporation has established at least seven dry-land sorting yards all located close to its own timber sources. This company maintains as many as thirty-five sorts on a single location. Sorts are by diameter, species, grade, and length and are specifically managed to satisfy needs of individual customers.... Weyerhaeuser Company also maintains dry-land sorting yards.[3]

Two site-specific studies were done in connection with the possible establishment of a merchandizing-concentration yard in the Bitterroot Valley of Montana. The first, prepared in 1975 by a University of Missouri researcher, viewed a sortyard as being a way to improve "the farmer-logger and stumpage market interface. The intent is to expand employment and earnings, improve the supply of farmer-logger generated material and contribute to resource management through expansion of in-woods utilization rates."[4] Because the study began with the assumption that a concentration yard was needed, it focused on internal policy issues (ex., Should product purchasing be restricted to certain types of sales, "without participating in existing sawtimber markets?") and the investment needs for implementation of various yard size and function options.

The second Bitterroot study, done in 1981 by the University of Montana under contract with the Economic Development Administration of the U.S. Department of Commerce, was an analysis of "the economic feasibility of [establishing] a wood concentration yard to improve utilization of the forest residue resource in the Bitterroot...."[5] The researchers concluded that, even under their most optimistic scenario for estimated product mix and market prices, the yard would lose money. "Much of the residue is now left in the woods because harvest costs still exceed the price that manufacturers are willing to pay." The report did note that the demand for forest residue

(primarily house logs and small diameter materials) could be expected to increase later in the decade.

In 1980, the Forest Engineering Research Institute of Canada conducted an evaluation and economic analysis of 26 log sorting operations along the coast of British Columbia[6] and, apparently concluding that additional such facilities could be beneficial, subsequently published a handbook for designing, building, and operating log sortyards.[7] In 1990, other Canadian researchers analyzed how sortyards function, and concluded that

> ... conventional sortyard operations are highly efficient when handling large logs. Problems arise when log size declines below $1m^3$.... Alternative sortyard configurations should be identified and tested to improve small-log handling efficiencies and enhance the profitability of small pulpwood and chip-n-saw products.[8]

The Lumby sortyard near Vernon, B.C., is one of the most studied and widely publicized facilities currently operating in North America, and its positive experience contributed greatly to the recent upsurge of interest in sortyard use. An in-depth analysis of its early history and operation is included in the 1995 Price Waterhouse audit and report on the Special Log Sale Project in the Vernon Forest District,[9] which concluded that the yard's first year of operation (1993/94) was a financial and marketing success.

Back in the United States, the Congressional Research Service looked briefly at log sort yards as part of a larger study evaluating possible alternative systems for improving Forest Service timber sale practices and procedures.

> The array of interrelated concerns has led some to suggest a complete overhaul of the current system of timber sales -- separating the sale of the wood from the contracts for cutting the trees.... [This] approach would entail an entirely new system for wood sales. First the Forest Service would need to establish log yards for delivery of the wood removed from the forest. Such yards are probably necessary to allow accumulation and sorting of wood deliveries...and to prevent the theft of timber.... However, in at least some areas, operating log yards and marketing wood could be contracted out.[10]

In a 1995 analysis (hereafter referred to as the Oregon report), representatives of the Willamette National Forest, the Associated Oregon Loggers, and the Weyerhaeuser Company looked at the economic feasibility of each of four methods of selling small logs.

> There is an ongoing struggle to define a process for contracting economically marginal sales of wood that have, in the past, been precommercial. [The comparison study document is] a proposal for service contract logging small wood

from federal timber sales in order to implement ecosystem management objectives.[11]

Although concluding that the service contract mechanism would be beneficial in facilitating the thinning of small diameter, overstocked stands, the authors projected net losses to the Forest Service if either roadside sales or log sortyards were used to market the resulting products.

Issues Overview

In reviewing the literature on sorting and/or concentration yards published over the last three decades, two factors -- public policy and private markets -- emerge as keys to site-specific go/no go decisions. For vertically integrated wood products manufacturing companies, the market situation may be the only issue of importance. If a sortyard does not enable the company to more efficiently and profitably use its available raw materials, then it is of little value.

For the Forest Service, state land management agencies, non-profit stewardship projects, private foundations, community economic development groups, and some environmental interests, the issues are more complex and policy-sensitive. For them a sortyard may be a means to help correct perceived market inequities or fill market gaps; a necessary mechanism to facilitate achievement of local economic development goals (such as the creation of value-added manufacturing businesses); a way to disconnect ecosystem restoration activities from the sale of forest products; part of an effort to improve public timber sale practices and procedures; a component of a program to create jobs for low-income persons or displaced workers; etc.

The decision of these agencies/groups to establish (or support the establishment of) any particular sortyard will depend upon the answers to a number of policy questions, coupled with detailed and site-specific market, technical, and financial analyses.

For individual entrepreneurs or smaller companies, the decision to start a sortyard or to contract to manage someone else's will be mainly a market/economic decision, although it may be influenced by policy decisions made by others which affect the yard's potential viability. Those might include public or private sector commitments to channel a certain volume of material through the sortyard for sale; provision of local government financial assistance (through, perhaps, a Community Development Block Grant Program low-interest loan) to subsidize initial sortyard cost; or local development corporation assistance with early-stage marketing activities.

Policy

Marketing System Gaps or Inefficiencies

The impetus for establishing some sortyards is the perceived need to add a "missing piece" to local log markets. Frequently the primary beneficiaries are small businesses -- woodlot owners, independent logging contractors, and value-added manufacturers.

For non-industrial woodlot owners, a sortyard provides several services. First, it enables the owners to sell their logs whenever they choose, in whatever amounts they wish to cut, and in whatever species, size, and quality mix they desire. Secondly, it helps them maximize revenues. In conventional markets,

> ...the asking stumpage price is based on the values of all the products present. Because the timber buyer usually wants to purchase the entire stand for a single product, however, he will offer a price based on the value he will receive for his product. The result is generally a compromise price which pays the land-owner less than he should receive and costs the timber buyer more than he should pay.[12]

A sortyard gives the woodlot owner the opportunity to sell to multiple buyers with minimum effort, and this is a definite advantage when the premium to be expected from the higher value logs would increase total sale revenues above the "compromise" price normally received from a single buyer.

Landowners also may wish to "separate the logger from the logs," contracting with one or more parties to do the harvesting and other land treatments, but not tying the contractors' payment to the timber removed. In this scenario, the landowner would pay the contractors on a per acre, per hour, or some other basis for their work. The amount of timber removed and the value of that timber would have no bearing on the contractors' compensation, so they would have no incentive to overcut or highgrade.

The use of a sortyard can reduce the financial risk for the small woodlot owner who is not fully conversant with market conditions and participants. Inexperienced sellers can make bad deals if they do not do their research or obtain sound advice. An unscrupulous buyer can take advantage of this weakness, purchasing a product for less than its fair market value. A sortyard fills the role of independent, impartial broker.

There are, however, some disadvantages which must be considered: (1) the additional time and expense of arranging transportation of the logs from the owner's property to the sortyard; (2) the fees charged for the sortyard's services; and (3) the time delays in receiving payment for the logs (after the logs are sold, rather than when they are removed from the property).

For independent logging contractors, a sortyard increases their ability to harvest and market multiple products profitably. If they buy a public or private timber sale that will yield a variety of products, the yard fulfills a marketing function that the contractors would otherwise have to carry out themselves. They can load various species and qualities of products together in the woods, and rely on the yard to separate the products and market them to the most appropriate buyers. The contractors' resources are thereby used more effectively and efficiently. As in the case of private landowners, however, contractors using a sortyard have to factor in the additional sortyard fees and the time lag in receiving payment. Some contractors may decide that the potential extra revenue produced from using a sortyard does not outweigh the ease and speed of selling directly to local mills with which they have good working relationships.

Contractors whose strength in is performing the work "on the ground" and who do not want to be responsible for log marketing may find that the availability of a sortyard makes more small private woodlot jobs available to them. Many non-industrial landowners sell their trees on mill-direct stumpage basis simply because that relieves them of the necessity of selecting logging contractors and selling logs. Some owners, however, might be persuaded to consider a more customized, end-results contract if they could be assured that marketing the resulting products would be easy. This option could be particularly attractive to landowners whose primary goal is not to create revenue from timber, but to improve the appearance of their property, enhance wildlife or recreation values, reduce wildfire danger to structures, and so forth.

Small, value-added wood products manufacturers (cabinet, door, and window shops; custom furniture producers; toy and gift companies; musical instrument crafters; log home builders; etc.) sometimes experience difficulties in being able to obtain the quantities and types of raw materials they need in a timely fashion. Buying in truckload amounts is prohibitively expensive for many of them. Further, their requirements tend to be very species-, size-, and quality-specific. Some large mills will separate out the needed material from larger loads and sell to these companies. Many mills, however, find that that sorting does not produce enough revenue to warrant the extra time and expense. Lacking a mill-direct market, small manufacturers are often forced into the retail market, buying from home centers and hardware suppliers. For these customers, a sortyard provides a much needed and cost-effective source of supply. As Lumby sort manager Tom Milne notes,

> "Sometimes it's really hard for small operators to get wood. Try to buy some yourself, and you'll see what I mean. At this project, anyone can come and buy logs. As long as you've got the money and you're the highest bidder, we'll sell them to you."
>
> This is the ideal way for occasional buyers to have trouble-free access to wood. "We get all kinds of people here looking at the logs and they have all kinds of reasons for wanting them. Just the other day, somebody asked what I was going to do with the waste pile. I had planned to burn it, but we ended up selling it

instead."[13]

In addition to being able to purchase exactly the materials they want, manufacturers can buy in the quantities and timeframes that fit their production needs. The sortyard becomes effectively a just-in-time supplier.

Market Inequities

Economies of scale and (in some instances) the strength of vertical integration may offer a distinct edge to larger firms when bidding on multi-product federal and state timber sales. If the mills purchasing those sales can't use all the logs in their own operations, they usually have yard space to sort out and market separately what they do not use. They also have ready access to the larger market place and to other, secondary buyers.

A log sortyard can provide a similar sort-and-sale capacity to smaller operators, for a fee. It becomes the rough equivalent of a contracted marketing department for the small business, and thereby may widen the competitive field in a geographic area ordinarily dominated by one or two large mills.

> Without log concentration yards, the timber operator who attempts to supply a number of different markets must meet minimum delivered quantity requirements and maintain contact with the buyers of each product to determine specification for their raw materials and to bargain over prices. This is, in many cases, so time-consuming and expensive that it prohibits multiple-product marketing.[14]

On the other hand, the introduction of a sortyard into a limited and relatively stable market area could have an adverse effect on all participants. If the existing mills are using locally the majority of the logs they purchase, running below optimal capacity, and/or operating on a thin margin, then a yard which encourages the entrance into the market of competing firms may be counterproductive. Increasing competition will drive up the price of logs when the supply is limited, and unpredictable material shortages (due to failures to win critical sale bids) may impair a company's productivity and its ability to meet customer needs. One or two healthy businesses are almost always preferable to five or six weak ones.

Improved Raw Material Utilization

One of the chief arguments for sortyards is that they enable each log to be marketed for its highest and best use, while minimizing waste. A report on the Lumby, B.C., sortyard noted that:

> The logs are measured by diameter at each end as well as by length. The measurements are fed into a hand held computer that calculates the exact volume. Hand scales like this are labour-intensive, but the higher labour costs required in

> the scaling are more than made up for in the price paid for the logs....
>
> The logs are sorted into fir that will be peeled by veneer manufacturers, fir and larch logs that will be converted into lumber, pine peelers, fir logs for log home building, white pine logs for flooring and siding and other sorts.
>
> "All the wood here gets sold for its best potential price and potential products," [contract employee Laurie] Stubbs says, "I think every piece of wood in the province should go through a sort yard like this because we're running out of the resource.... There's no waste this way."[15]

The Lumby yard maintains 44 sorts, including such items as "spruce (acoustic)," "bridge stringers," "character logs," and "all (green & dry) (firewood)." Sorts are designed to meet the specific needs of identified customers -- including a guitar manufacturer, construction companies, wood craftspeople, and architects (who use the character logs for accents in rustic-style buildings). A local small business buys firewood logs and collects other scrap, then cuts and remarkets it to individual household customers.

A sortyard in Takamori, Japan, reports similar utilization levels, although using fewer sorts. Buyers from throughout Kyushu Island come to the yard for items such as curved Japanese cedar, curved cypress, and various species in straight lengths. Oddly shaped logs not otherwise marketable are cut into short, straight logs for specialty uses. Scrap materials go for firewood, and the only waste remaining is a small amount of bark[16]

By improving utilization of forest resources, sortyards can facilitate implementation of public policies promoting greater economic and environmental sustainability. They can also help reduce wood exports and/or increase import substitutions by providing the supply necessary to support smaller, local value-added manufacturing operations.

Some critics, however, believe that using sortyards to encourage the "separation of the logger from the logs" could actually result in less efficient wood utilization.

> ...[Log] values are greatly influenced by how the logs are cut in the woods, because mills have widely differing requirements. This is a particular problem in areas with a variety of mills and a mix of timber species, sizes, and grades, such as Washington, Oregon, Idaho, and northern California. Without feedback from mills or log yard operators, harvest contractors' cutting might lose a substantial portion of the wood's market value; however, if the feedback were too strong, the ecological benefits of the harvesters' independence could be compromised.[17]

Industry officials in Montana have expressed similar concerns, arguing that introducing a sortyard as a "middleman" between the logger and the mill will increase costs (to cover

transportation, sorting, and marketing through the yard) and still might not produce logs cut to the purchasing mills' particular specifications. If the logs are cut too short, they cannot be used for their optimal purpose, and if they are cut too long, they must be re-cut, thus generating more waste as the excess is removed.[18]

Improving the Stewardship of Forest Ecosystems

One element of the demand for greater use of stewardship contracting on public lands is the belief that the most frequently used management tool (the timber sale) is too narrowly focused on a single component of the ecosystem and provides little or no positive incentive for the exercise of careful stewardship.

> One of the most widely discussed advantages of harvest contracting is the potential to further implementation of ecosystem management. Basing harvest contracts on the work performed and the resulting conditions of the forest (and ecosystem) could eliminate the existing incentives for inappropriate harvesting that have contributed to the forest health problems of the interior West. Furthermore, ecosystem management and forest health improvement could be done regardless of the existence of harvestable timber on the site; this is particularly important in areas with young, dense stands. The use of salvage or commercial thinning in the current system requires having merchantable timber, often with desirable and relatively undesirable timber combined in one sale to assure that it can be sold.[19]

If using sortyards in combination with stewardship service contracts helped generate some revenues from very small diameter (pre-commercial) thinnings and removals of other usually-unmerchantable trees, it would eliminate the perceived need for cross-subsidization (designing sales so that enough larger merchantable timber is included in salvage and thinning projects to make it profitable for mills to bid on them).

There is, however, an inherent danger in coupling the discussion of forest stewardship contracting with that of sortyard sales of logs. Stewardship contracts intentionally "separate the logger from the logs" -- to direct the contractor's focus away from commodity production and toward the overall health of the forest ecosystem. Timber removal may be a part of the stewardship activity, but it is not its primary purpose.

Unfortunately, because of the very limited funding available to public land managers (especially the U.S. Forest Service) to implement stand-alone stewardship projects, most of the community-based stewardship programs have been forced to use some version of existing timber sale contracting mechanisms to carry out their work. This reinforces skeptics' beliefs that advocates of such efforts are merely timber "wolves" in stewardsheep's clothing.

So, it is important to make clear that:

1. Stewardship work does not have to generate saleable products. It is, quite simply, work that is done over time to maintain, restore, and/or enhance various ecosystem components, structures, flows, and processes. This includes (but is not limited to) such activities as stream or streambank restoration, wildlife habitat improvement, noxious weed eradication, and tree planting and thinning to encourage reforestation and/or species diversification.

2. Some stewardship projects, however, may generate saleable materials as a byproduct of the work. To ensure that the contractor has no incentive to increase the amount of material harvested or manipulate ("sweeten") its composition, s/he should have no ownership of it and few or no salvage rights. The material should be sold in a completely separate, arm's length transaction -- hence the roadside sale or sortyard mechanisms.

3. The existence of a roadside sale program or sortyard in any given market area may make it easier to implement stewardship programs in that area by providing a collection and marketing facility and system to handle a relatively unpredictable flow of products of varying size, quality, and quantity.

Furthering Economic Development Objectives

Adversely impacted by declining harvest levels on nearby public lands and/or by increasing imports of lower-cost foreign wood products, many rural forest communities have crafted revitalization strategies that rely heavily on "value adding" and "diversification."

The former aims at capturing more value from the same or lesser amounts of timber volume through secondary or tertiary processing which creates products that can be sold for more than logs alone would bring. For example, the milling of logs or grinding of chips are primary processing activities. Secondary processing would convert the boards into components parts for cabinets or the chips into fiberboard. Tertiary processing further manufactures those products into finished cabinets or specialized moldings ready for installation in homes or businesses. At each stage of development, additional materials and labor are added to the original raw wood product, and its value in the marketplace is increased substantially. More workers also are needed for production, marketing, transportation, and related activities.

A sortyard contributes to this process by ensuring that each log is marketed to produce the most value for the seller and for the community -- so that, for instance, wood of a certain type and grain is sorted for sale to a musical instrument producer in the area, rather than being chipped for a linerboard mill.

The effective use of a sortyard to support value-adding efforts requires good research into potential market opportunities, an aggressive marketing strategy to ensure that customers are aware of the yard's products and services, user-friendly sale and transportation arrangements, and flexibility on the part of yard managers to change or add sorts and lot sizes as market conditions and needs change.

The sortyard itself can be a self-supporting value-adding business, but the community (either through public or private non-profit efforts) may also choose to subsidize sortyard operation in order to ensure the raw material availability and affordability necessary to attract new wood products manufacturers or to encourage existing ones to expand. In Libby, MT, for instance, the local economic development corporation has covered its yard's $25,000 operating deficit because the yard's services are a necessary part of the community's economic development efforts, and also to give the yard an opportunity to become profitable and (hopefully) be spun off as an independent private business.[20]

Unlike value-adding strategies, economic diversification plans encourage the development or expansion of industries that are not timber-dependent -- tourism, business services, light manufacturing, health and retirement services, etc. Some communities' economic development programs include retraining displaced workers, and they may try to create new jobs for former loggers or millworkers in watershed restoration and other environmental service occupations.

In that case a sortyard is a vehicle to sell the by-products of the restoration or improvement work, and a possible way to generate funds which can be "recycled" to fund more such work. The collection (concentration), merchandising, and selling capabilities of a yard in that scenario are likely to be more important than any sorting it does. The material received will be made up of smaller, generally less valuable, stock. Finding markets for it and amassing sufficient quantities to sell by the truckload will be important. Chipping, sawing to length, post or pole processing, etc. can be done to add some value in-yard prior to sale.

Increasing Timber Available from Private Woodlands

In 1964, Lewis observed that

> ...large forest ownerships alone cannot meet the demands of the wood-using industries. The loss of the timber supply from small woodlands must be considered. The small, scattered forest lands are of little importance individually, but in the aggregate they are a very important part of the wood supply and cannot be ignored. It is necessary that the marketing system be adjusted to insure that timber on these lands can be harvested.

Today, small woodlands are recognized as having significant importance in addition to their

value as timber producers. They provide wildlife habitat and travel corridors, create recreational opportunities, offer open space and other scenic advantages to landscapes, and so forth. Yet there is no question that, with the reduction in timber harvests on federal lands, there is increased interest in tapping the timber resources of non-industrial private forests.

A log sortyard affords landowners considerable flexibility in planning the timing and size of their harvest and also reduces some of the elements of economic and technical risk for them.

Interestingly enough, in Japan the yard is seen as reducing the risk for timber buyers.

> At one time timber still on the owner's land was sold directly to the buyers and removed by the buyers, but this method caused buyers to have a lot of risk and liability, so they changed to the log sorting and sale yard method to avoid those risks.[21]

Market and Financial

If policy considerations seem conducive to the creation of a log sortyard, final decisions should rest on a thorough analysis of the market and financial feasibility of the project.

Because the sortyard feasibility studies reviewed for this report were carried out over the course of two decades and in three different countries, it is difficult (and sometimes misleading) to make comparisons and draw conclusions. Therefore, this section draws almost entirely from the experience of sortyards operating in the 1990's or from feasibility studies done within the past five years. Doing side-by-side comparisons of costs in US$, Canadian$, and Japanese¥ leads to additional problems. Still, certain key elements appear relatively constant from country to country and year to year. A look at similarities and differences follows.

Goals

The primary reasons to create a sortyard are to: (a) improve the utilization of natural resources; (b) provide a competitive marketplace to serve buyers and sellers with a variety of needs; and (c) facilitate forest health and/or land management objectives. Depending upon the time or place, the order of importance of these goals may change. From the 1960s through the mid-1980s, utilization and market maximization were more important. In recent years, however, the emphasis has shifted to forest health and stewardship considerations.

Secondary objectives can (but do not always) include job creation, attraction or expansion of value-adding businesses, increased access to the market for non-industrial forest landowners, or supply stability for manufacturers.

Government involvement in and subsidization of sortyards either directly (as owner or operator) or indirectly (through grants or below-market loans made to private for-profit or non-profit yards) is justified by the perceived public good to be obtained -- job creation, economic diversification, environmental restoration, etc.

Ownership and Initial Capitalization

In Japan, Canada, and (to a lesser extent) the United States, government has played an active role in sortyard creation. The Takamori yard, for instance, was initially financed by the Japanese federal government (40%), the Kumamoto Prefectural government (9%), Takamori Town (10%) and the Takamori Timber Association, made up of lumber-related private businesses (41%).

The Lumby yard was created by the Ministry of Forests (MOF) of the Province of British Columbia as one of two pilot projects "to explore new ways of harvesting timber, other than

conventional clear-cutting, and to increase the knowledge of log marketing."[22] All costs of harvest, transport, marketing, yard operation, and administration are paid by the Province.

In North Vancouver, B.C., the Greater Vancouver Regional Development District (GVRD), a consortium of local governments, owned a sortyard to process timber harvested on their public lands, but contracted with the private sector for the yard's operation. The sortyard was phased out in the mid-1990's, however. Increasing public opposition to logging led the GVRD to abandon its sustained yield management program on the forests in the communities' watersheds. Trees are harvested now only as part of specific water management projects, and those harvests are minimal.[23]

The federal government (through various grant programs) has subsidized several sortyard feasibility studies in the United States, and some state and federal grant and loan programs are available to private for-profit and non-profit entities which create sortyards for economic development purposes.

The Libby (MT) Log Yard was started in 1996 by the non-profit Lincoln County Economic Development Corporation (LCEDC) using "impact funds," money given to the community by Champion International and Stimson Lumber when industrial forest lands in the area were sold and major mill facilities closed. Low-cost rental space for the yard is provided in the City of Libby's industrial park, and a Forest Service grant has been awarded to enable the yard to purchase a small drying kiln. The LCEDC has been covering the yard's financial losses to date.

Of course, both in the United States and Canada numerous forest product companies (generally larger ones, such as Weyerhaeuser and Crown Zellerbach) set up and operate their own sortyards without government assistance.

Costs

> The supply of various products in the concentration yard's procurement area is the major controlling factor. Available products and their proportion of the sustained supply will provide guides to yard size, equipment needed, and markets that must be sought. Because the yard will be buying primarily roundwood products, transportation costs will determine the procurement area, but the sustained production of the woodlands will determine the amount of investment in the yard.
>
> A second consideration is the markets to be supplied. Here again transportation costs would be one of the controlling factors, but there would be more flexibility than in the case of supply, because small amounts of manufacturing at the yard would greatly enlarge the market area and the presence of the yard could very well attract other wood-using industries into the region, either as separate industries or

as part of the yard itself.[24]

Land

At Lumby, which receives a wide variety of products and maintains a large number of sorts, a 160,000 square meter (39.54 acre) yard was used to handle 53,000m³ of product. For Takamori, with a much narrower sort range, an 18,210 square meter (4.5 acre) site was sufficient to handle 18,000m³. In Libby, which has more of a collection yard than a sortyard, 2,790 square meters (.69 acre) was all that was required for a start-up of approximately 2,465m³.

Of course, the cost of land is a consideration. In the United States and Canada, open land is plentiful and relatively inexpensive. The Lumby and Libby yards were affordably able to lease their sites (C$1,108/acre annually for Lumby, and US$1,739/acre annually in Libby). In Japan, however, land is scarce and expensive, and purchasing unimproved ground for the Takamori yard cost ¥40,000,000 (roughly $89,000 per acre), one-third of the total cost of developing and equipping the yard.

Other factors which bear on sortyard size and cost include inventory turnover rates, utility availability, proximity to highway and rail transportation, security considerations, and local zoning regulations.

Yard location and duration are important considerations. The Lumby yard has minimal permanent improvements (as would the proposed Oregon yard), and the Price Waterhouse auditors recommended that the operation be moved to different locations within the region, depending upon where harvests are occurring. They note that this also "would ensure that local purchasers do not always have the same freight advantage."[25] The Takamori yard is a permanent facility, but the relatively small size of the island of Kyushu makes haul distance a much less significant issue there. GVRD had a well developed physical facility designed specifically to handle product from local municipal watersheds.

Site Improvements

The 1995 Oregon feasibility study proposed to use federal land ("a rock pit or other low impact site"[26]), do no subgrade or surfacing work, and have "negligible establishment and rehabilitation costs." On that basis, the researchers estimated that their sell location cost would be $3.09 per ccf (approx. US$1.09/m³). Lumby and Libby leased existing industrial sites. Takamori spent ¥27,000,000 (approx. US$270,000) to prepare and completely pave its sortyard, but can amortize that cost over 20 years or more. Assuming a constant volume of 18,000m³ per year for 20 years, the amortized cost would be US$0.75/m³.