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## **Rural Economic Development through Integrated Smallwood Forest Products Centers**

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**Abstract.** *Forest Concepts led the development of a conceptual plan for a smallwood manufacturing center. The Cascade Forest Resources Center (CFRC) is envisioned to be a forest products business park housing 7-10 businesses on a common site. Businesses would include both natural resource service providers and manufacturers. Manufacturers would link to a common woodyard and merchandiser. Gross revenues for participant companies may be in the range of \$10 – 30 million per year. Forest Concepts conducted over 50 interviews and drew on its past experience to identify business opportunities that have a strong fit with the smallwood enclave concept. The business opportunities can leverage timber resources, access to markets, shared infrastructure and/or services of co-located businesses. This paper uses the Cascade experience as a case study for development of a new smallwood industry to capitalize on the shift to partial cuts, thinning and small diameter timber.*

**Keywords.** Forest products, rural development, forestry

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## Introduction

Rural timber dependent communities rely heavily on traditional high-volume mills and wood products for jobs, economic support and community development. Cascade, Idaho is no exception. Cascade is nestled in the lodgepole pine forests of central Idaho and has a population of approximately 1000. The area's largest employer, a dimension lumber sawmill closed in 2001. What was a viable timber town is suffering economic hardship until new timber and forest products employment opportunities are created. The Cascade situation is typical of dozens of rural communities across North America.

The loss of large-scale industrial mills in the region is due, in part, to a shifting timber resource and shifting forest management practices. The resource is changing from a large log, clearcut base to a smallwood, partial-cut base. Large logs are still present, but represent a small fraction of the total stem count. The traditional methods for logging, hauling and milling are no longer cost effective in a diverse smallwood environment. We expect that an "enclave" business center that includes many independent, yet resource co-dependent businesses will replace the traditional single dominant employer concept.

The Cascade Forest Resource Center project evaluated the potential to establish a manufacturing center to produce innovative products from small-diameter timber, thus supporting the community into the future. The location and nature of Cascade fits within the requirements needed to operate an enclave of co-dependent specialized wood-products companies. Cascade is situated along a well-maintained highway and has easy access to trucking and hauling operations. A rail system is also available for transport and distribution of materials and products. The citizens have a good understanding of manufacturing wood products, and there is a positive relationship with forest and natural resource industries. A healthy balance between public and private timberlands lessens dependence on public timber resources.

Advantages held by Cascade include:

- Natural resource based economy
- Availability of forest products workforce with experience
- Readily accessible private, state and federal timber resource
- Central point for finished goods transport to Utah, Montana, California, Oregon, Washington and all of Idaho
- Supportive community and local government
- Attractive quality of life for workers
- Recreational opportunities that provide incentive for visits by clients, customers and visitors

For Cascade to maintain its livelihood as a timber-based community, a new forest products industry must be created. The creation of such an industrial base would:

1. Maintain viable employment for forest and wood products workers. In turn, this will also support allied local businesses such as private trucking and hauling companies and forest operations contractors.
2. Diversify employer base to reduce dependency on few dominant employers.
3. Diversify forest products to reduce market risks and subsequent impacts on employment and local economic activity.

4. Provide ongoing revenues to forest landowners, thus encouraging active forest management.
5. Encourage utilization of small diameter timber from thinning in public and private timber operations. Revenues from these practices are expected to encourage expansion of thinning operations and reduce wildfire risk.
6. Production of habitat products, such as those from ELWd Systems ([www.elwdsystems.com](http://www.elwdsystems.com)) encourages local fish, wildlife and water quality enhancement programs, which should lead to subsequent growth opportunities tied to tourism.

With financial support from the United States Forest Service and the Idaho Department of Commerce, Cascade engaged Forest Concepts to conduct a demonstration and evaluation of the potential for creating a new smallwood business center to achieve the city's economic and employment goals. The demonstration and evaluation were conducted during the summer and fall of 2001. The objectives of the demonstration included:

- Showcasing the economic utility of bringing smallwood that is 75 – 200 mm (3 – 6 inch) diameter to town for processing.
- Assessing the capability of the local logging and hauling infrastructure to handle small diameter and short wood.
- Evaluating the willingness of experienced mill workers to convert to a smallwood mindset.
- Demonstrating to agencies, potential businesses and grantmakers that the community is prepared to adopt and support new ways of thinking about the forest products industry.

## **Cascade Forest Resource Center Concept Evaluation**

Forest Concepts conducted over 50 interviews and drew on its past experience to identify business opportunities that have a strong fit with the Cascade Forest Resource Center (CFRC) concept. The suggested business opportunities can leverage timber resources, access to markets, shared infrastructure and/or services of co-located businesses.

There are a number of manufacturing opportunities that support an integrated smallwood business center. Directly complementary products and facilities consist of:

- Post and pole facilities
- Wood biotreatment facilities
- Manufacture and distribution of WoodStraw™
- Wooden fencing for riparian and range lands
- Rustic furniture for indoor and outdoor use
- Log home and cabin components
- Naturescape materials and mulches
- Habitat enhancement commodities (rock, anchoring equipment, wood handling tools, etc.)
- Erosion control materials
- Biomass energy production
- Training and educational workshops

A related opportunity is to create a service division of the center. Services provided under this division could include:

- Forest thinning
- Wood extraction
- Watershed restoration and engineering
- Wildlife/Wetland ecosystem engineering and installation
- Post fire erosion control and rehabilitation
- Fuel reduction thinning and pruning
- Forest lands management, logistics and mensuration

The actual number and types of businesses are limited only by the entrepreneurial sprit of local businesspersons and the vision of those recruiting outside firms to relocate to the center.

Cascade does not presently have a business park or other industrial center upon which to create the CFRC enclave. It is most likely that the community or a private developer will need to build a “greenfield” smallwood products business center. Whether a greenfield center is an advantage or not depends on the history and layout of existing wood products facilities that may become available. Warehouses, shops and shipping facilities may be directly applicable to a new smallwood business. However, large woodyards and large-log merchandisers may lead to higher cost log handling than a smallwood facility can support. With smallwood, efficient piece handling is critical.

Our best estimate is that the CFRC business center will occupy approximately 8- 12 ha (20-25 acres) of land, much of that being woodyard, pole yard and outdoor wood handling areas. Co-located on the complex would be four to six buildings from 700 – 3000 m<sup>2</sup> (2,000 to 10,000 square feet) for independent manufacturing enterprises. A 2,000 m<sup>2</sup> (6,000 square foot) office complex would house up to five service businesses plus the CFRC administrative offices.

The capital cost for developing the site, buildings and major equipment is likely to be in the range of \$10 million. Once fully operational the CFRC business may generate revenues of \$10 – 30 million annually and employ more than 50 hourly and professional workers.

### ***Demonstration Manufacturing Business***

The City of Cascade purchased a small building on 0.25 ha (0.6 acres) to use as a business incubator and transition facility for companies being recruited to locate in the area. Cascade provided the building to Forest Concepts rent-free for use during the evaluation.

Forest Concepts’ portable manufacturing line was set up in Cascade on August 15, 2001 and three local workers were hired as temporary employees. The employees proved eager to learn new manufacturing methods and quickly became proficient at building ELWd<sup>®</sup> structures from smallwood. The facility was scheduled to run four weeks under the evaluation program, and then additional weeks as order flow and weather allowed continued operation.

The U.S. Forest Service local district assisted the project by scheduling two fuel-reduction timber sales to coincide with the demonstration. A local cooperator purchased the two sales from which to harvest materials for the evaluation projects. One sale was a two-acre unit near Warm Lake, ID. All materials were hand-felled and skidded with four-wheel ATV vehicles. Delivery was in pickup trucks and a utility trailer. All poles were loaded and unloaded by hand.

Harvesting and hauling was accomplished by local volunteers having extensive forestry and logging experience. Although experienced in the woods, the learning curve was steep since no one had experience with selective smallwood harvest in ultra-small units. The first few tons of wood were provided to Forest Concepts at no cost as part of the community's in-kind match to grant funds. The cooperator then invoiced Forest Concepts for all subsequent wood delivered to the project at a rate of \$100 per ton – a fair market cost for smallwood harvested by hand. With appropriate smallwood mechanization, the cost may be reduced substantially. Investment of capital in equipment and development of improved methods is dependent upon having certainty that the CFRC and other local wood users will provide a long-term demand.

Yield of products from the smallwood poles was excellent. Poles were generally on specification for straightness, soundness and overall quality. The major source of off-spec material was logs that were too large of diameter for use in ELWd<sup>®</sup> structures, yet too small in diameter for traditional saw mills to purchase. This problem of utilization is another factor that supports development of a cooperative woodyard and enclave of co-dependent wood products businesses.

### ***Smallwood Pricing and Trade Standards***

Most small diameter timber is sold by the ton. However, it is generally accepted that tonnage pricing is problematic, since it does not account for quality, age since harvest, utility and other attributes. U.S. Forest Service sales are typically quantified by the cubic foot, which also has little relationship to the value or utilization potential. The preferred unit of sale is an assigned piece price, with the price varying by diameter, length and quality. Piece price is also problematic in that every individual stem would need to be graded to an agreed standard. No grade standards for small diameter wood exist at this time. It is readily apparent that grade standards will need to be developed before efficient commerce can be had in small diameter timber. Lacking regional standards, we believe that the cooperators in an integrated smallwood products will need to agree on a local standard for grading to use in purchase and sale contracts.

Forest Concepts worked with a number of smallwood buyers in the rustic furniture, post and pole, fencing, biomass energy, and sawmill business to define a tentative set of smallwood standards that would be appropriate for a smallwood enclave. We found that current market transactions are limited primarily to pairs of loggers or landowners and niche smallwood users. Each pair of supplier and buyer tend to develop a lexicon (e.g., cabin pole, fence rail, bed post) and a mutual understanding of value. While effective for the participants, the method is not conducive to efficient markets over wider groups of products and geographic areas.

The proposed standards include 12 grades with a furniture appearance grade at the top and mulch at the bottom. Grades are defined by descriptions of each of the following attributes:

- Straightness
- Taper
- Swell
- Bark Appearance
- Bark Damage
- Wood Damage

- Branch and Stob
- Wood Quality
- Decay and Insect Damage
- Time Since Harvest

Along with qualitative grade, the market would consider log butt or top diameter, species, and length. When we translated the grades and sizes to a tonnage equivalent, we arrived at ton-wood values of over \$200.00 per ton for the highest appearance grades and \$5.00 per ton for the lowest mulch grades. Given a 40:1 range in piece value, it is readily apparent that a competent smallwood seller and/or effective independent woodyard can maximize revenues compared to those less competent.

The first draft of a smallwood grading table was provided to forest products specialists at the University of Idaho, Oregon State University, University of Washington and the USFS Forest Products Laboratory for their comment and refinement. Substantial investment of time and resources will be needed to develop trade standards that have the acceptance held by large log grades.

## **Outreach**

Forest Concepts made presentations and/or conducted demonstrations for many state and federal agencies in Idaho. The USDA NRCS, U.S. Forest Service, the University of Idaho and CH2M Hill in Boise hosted significant workshops. Demonstrations were conducted for BLM in Shoshone, NRCS in Boise, ID Dept. of Environmental Quality in Coeur d'Alene, Palouse - Clearwater Environmental Institute in Moscow, National Marine Fisheries Service in Hagerman and Coeur d'Alene Tribe in Plummer.

The concept plan for the Cascade Forest Resources Center was presented in September 2001 at a regional smallwood economic development event in Hamilton, MT. The Central Oregon Intergovernmental Council (COIC) hosted a presentation in early February 2002. An overview was presented to the Board of Directors for Mason Conservation District in late February. The business plan was featured in a company exhibit at SmallWood 2002 in Albuquerque, NM in early April 2002.

Feedback from outreach events contributes to a better understanding of how the enclave model might be improved, and how it will translate to other communities and regions.

## **Current Status**

Since the completion of the Forest Concepts evaluation, the Cascade community continues to pursue development of a smallwood business center. They are aided by local, state and federal agencies. The community leaders have come to understand that the development process will be measured in years rather than weeks or months. However, they are committed to restore a viable forest products industrial base to the community.

## **Conclusion**

Forest Concepts led the development of a conceptual plan for a smallwood manufacturing center. The Cascade Forest Resources Center (CFRC) is envisioned to be a forest products business park housing 7-10 businesses on a common site. Businesses would include both

natural resource service providers and manufacturers. Manufacturers would link to a common woodyard and merchandiser. Gross revenues for participant companies may be in the range of \$10 – 30 million per year.

Forest Concepts conducted over 50 interviews and drew on its past experience to identify business opportunities that have a strong fit with the CFRC concept. The business opportunities can leverage timber resources, access to markets, shared infrastructure and/or services of co-located businesses.

Numerous outreach events and presentations we held over a six-month period. The Cascade concept continues to appear viable, provided substantial economic development support is provided by agencies.

### ***About Forest Concepts:***

Forest Concepts, LLC, is headquartered in Federal Way, WA. It is in the business of developing innovative forest products and providing natural resource services. The company develops and manufactures specialized roundwood structures and related materials for the erosion control, environmental restoration and landscape markets. The Company's ELWd<sup>®</sup> ("el-wood") structures make it easier and more practical to restore degraded wetlands and enhance fish and wildlife habitats. The Company's FlowCheck<sup>™</sup> erosion control products use readily available small-diameter timber to create functional erosion control materials for burned over lands, construction sites, roadsides and landscapes. A line of roundwood landscape planters offers a desirable rustic feel to residential, municipal and commercial landscapes.

ELWd<sup>®</sup> brand habitat structures are typically manufactured as kits by regional outsource partners in traditionally timber-dependent communities and delivered to project sites ready for installation. Most products are made from small diameter timber collected as a byproduct of forest health improvement programs and wildland / forest fuel reduction projects. Production of the Company's products supports the economy of rural and timber-dependent communities, as well as contributes to the development of sustainable small businesses and the forestlands of a region. Further, the Company's products are designed for ease of handling and installation by citizen-volunteers and conservation crews. For more information visit the company's web site [www.elwdsystems.com](http://www.elwdsystems.com) .

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