



**Economic Development and Wood Utilization in Rural
California Communities:
A Need and an Opportunity**

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Jonathan Kusel, Nick Goulette, Camille Swezy

Jonathan Kusel, Ph.D., and Camille Swezy are Executive Director and Biomass Project Associate, respectively, at the Sierra Institute for Community and Environment, Nick Goulette is Executive Director of the Watershed Research and Training Center.

Should you have questions or comments please contact
Jonathan Kusel at the Sierra Institute
JKusel@SierraInstitute.us or 530-591-3155

Introduction

Since in the mid-1980s, rural forest communities of California have struggled with the decline of wood products industry and related businesses, along with a decline of general socioeconomic conditions. In the 1980s, roughly 4,000 wood product industry jobs were lost in the north state as they “moved” south; less efficient mills in rural communities were closed and new secondary product businesses opened closer to south state population centers. Starting in the 1990s, increased environmental restrictions reduced available timber on public lands, a pattern that has continued for the last 25 years. The northern and California spotted owl were the most prominent of the species that affected forest management, but they were by no means the only ones.

In the northern spotted owl habitat area of California, 54 mills closed between 1990 and 2012, resulting in a loss of 5,645 jobs. In Humboldt County alone, 17 mills closed during this period, with 2,000 workers laid off. Shasta County lost ten mills during this time, most closing between 1990 and 1995, resulting in 1,239 jobs lost. Because of its straddling of the I-5 corridor and proximity to the Coast Ranges, Southern Cascades, and Northern Sierra, Shasta County still has four open mills employing roughly 500 workers. Loss of mills in the northern spotted owl region followed the loss of mills in the Sierra, most of which were closed as part of consolidation efforts and for competitive and efficiency reasons, along with reduced access to timber.¹

Loss of mill and forest work reveals only part of the decline of socioeconomic conditions of rural forest communities in California. As rural residents struggled with the decline of timber industry manufacturing jobs and forest work, in the 2000s, many rural forest communities lost construction and related building jobs stemming from the decline of second home development. This work collapsed prior to and as part of the Great Recession that hit rural forest communities particularly hard. For example, Plumas County by 2010 had lost over half the number of jobs in the construction industry that it had in 2006.

During the Great Recession, unemployment rates of 20 percent were all too common in forest communities. Countywide unemployment rates in Plumas and Trinity Counties hovered at 20 percent in 2010. Families left rural communities as employment opportunities dried up, and school populations declined dramatically. Like mills, schools were consolidated, leaving some communities without a local school, the lifeblood of a rural community. Between 1994 and 2010, Plumas County lost 40 percent of its student population. Other predominantly forested counties fared similarly. Student participation in Free and Reduced Price Meal programs increased at those schools that remained open, as families that stayed were less well off and sometimes without work. Most families that moved away have not returned. Rural communities are only just beginning to recover from the Great Recession, lagging behind their urban counterparts.

¹ These data drawn from Kusel et al., 2012. “Response to the Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl by Industrial Economics,” Sierra Institute for Community and Environment Report prepared for the National Forest Counties and Schools Coalition, 169 p.

Implications for Today

As fire suppression and selective logging altered the structure of forests, and as environmental restriction reduced access and management, prolonged drought, changing climate, and beetle infestations increased tree mortality and increased risk of catastrophic wildfire. One of the key impacts of the decline of rural manufacturing and forest jobs, is the decline of infrastructure or, simply, capacity to complete forest work.

Today there is an inverse relationship between local capacity to do work in the forest and tree mortality. Areas in the southern Sierra hardest hit by tree mortality are where there is the least capacity to remove and manage this material. Distant, often out-of-state, contractors are relied upon to complete needed forest work. The north state, with less (though still increasing) tree mortality, has more forest contracting businesses, though contractors from out-of-state locations are regularly employed across this region as well.

With over 100 million trees dead and more dying in California, Governor Brown recognized in his Proclamation of a State of Emergency in October of 2015 that there is a desperate need to thin forests to reduce risk of catastrophic wildfire and keep vital watersheds healthy. Remaining mills lack the capacity to handle much of this material because they are overflowing with trees burned in recent mega-fires and from thinning and protecting their own industrial timberlands.

Reducing wildfire risk and restoring forests is expensive and labor-intensive, as small-diameter trees have little commercial value. Reintroduction of fire on the landscape is needed, but in many areas thinning is needed before fire can be safely introduced. Because few outlets exist for small material, disposal is often accomplished through open pile burning that in turn generates harmful emissions.

An Opportunity

Despite these challenges, there are a host of communities and groups that have organized to take on the challenge of reducing fire risk, reintroducing fire back onto the landscape, and rebuilding local economies based on sustainable forest management and business development. The millions of dead and dying trees present an opportunity and a supply for launching businesses, creating local jobs, and beginning the task of rebuilding rural forest community economies. *Community-scale thinking, investment, and commitment to these outcomes, however, are needed if efforts are to succeed.*

Below we offer ideas for businesses, some of which require cooperative development in order to create a viable business, as well as to operate at a scale that will meaningfully reduce the risks and hazards associated with poor forest health. We offer also a commitment to advancing these ideas not only for ourselves and our communities, but to continue work underway with the many partners with which we are now working to develop sustainable community-scale forest businesses.

These ideas are tailored to the needs of the high fire risk dry forests, but they are by no means restricted to them; wet forests also have extensive forest and watershed restoration needs that

involve re-introduction of fire, and management needs that can restore watershed function and contribute to community improvement.

It is important to mention that the State of California has supported policies and programs to advance bioenergy development. This includes support for operation of existing biomass power facilities (BioRAM) that utilize biomass from high hazard areas, and the creation of new small-scale bioenergy facilities (BioMAT) that use residual material from sustainable forest management activities. The latter program, seemingly full of promise is challenged by Investor Owned Utility opposition, geographic limitation to Investor Owned Utility service areas, and capitalization costs. Both of these programs are important, but incomplete, especially if wood utilization is to take place at the pace and scale needed.

Who

Many rural forested communities across California are working to advance community-scale efforts for increased utilization of woody biomass close to its source. As state leaders in the development and practice of community based forestry, the Sierra Institute for Community and Environment in the northern Sierra and the Watershed Research and Training Center in the Trinity Mountain region have been working to explore wood product market opportunities that align with our individual and collective strategies for local forest stewardship and economic development. Both groups are advancing wood product utilization businesses in their home locales and beyond.

The Sierra Institute for Community and Environment, with support from the U.S. Forest Service, USDA Rural Development, California Energy Commission, and the Sierra Nevada Conservancy, has spent considerable time exploring potential business and market opportunities for production of value added products through small tree utilization and other woody biomass material. Recently, the Sierra Institute has been working to re-develop an abandoned sawmill site in the town of Crescent Mills to increase utilization of forest thinning material, including bringing in a mass wood business to the state. This integrated biomass utilization campus will use a variety of technologies to convert low value wood into value added products. The Sierra Institute is working as well with other groups through its USDA-funded Rural Community Development Initiative (RCDI) program, a peer-learning network aimed at building capacity of those working to implement wood utilization projects, and also with support from a USDA Rural Business Development Grant to identify businesses that organizations can successfully pursue. The Sierra Institute helped launch that the statewide biomass working group and has been a member of the State Wood Energy Team led by the Watershed Research and Training Center.

The Watershed Research and Training Center has been working on local wood utilization and business development for nearly 20 years. With funding support from the U.S. Forest Service, USDA Rural Development, the Ford Foundation, Weyerhaeuser Family Foundation, the Irvine Foundation, the US Endowment for Forestry and Communities, and with private debt and equity partners, the Watershed Center purchased an abandoned sawmill site in the town of Hayfork and started up a commercial firewood business, Tule Creek Forest Products. The Center is working with two other local wood products businesses through the local Trinity Business

Incubator to utilize and add value to wide range of wood products. Statewide, The Watershed Center has been working since 2011 on organizing and providing technical assistance to community-based, state and private forest biomass leaders through the CA Forest Biomass Working Group and the CA Statewide Wood Energy Teams. With support from CAL FIRE, the U.S. Forest Service, and private utilities, the Watershed Research and Training Center provided direct funding and technical assistance to 13 community-lead wood utilization projects around the state, all of whom need sustaining support to establish commercially viable enterprises that support forest stewardship and rural community benefits.

What

One of the most significant challenges of moving dead and dying material out of the forest is not harvesting and transport, but it is determining what to do with the raw product. For landscape treatments to be successful at the pace and scale necessary to reduce risks and improve landscape health, investment in marketing and wood utilization technologies is needed. The Sierra Institute and the Watershed Center have identified a variety of value-added forest products that can be feasibly and sustainably produced from our regions and others around the state. These products offer opportunities for increasing wood utilization and forest health, along with improving local community socioeconomic health. The following are some of the products identified followed by a brief discussion of work completed to date and needed follow up work.

Products include:

- Firewood
- Posts and Poles (tree stakes, fencing, temporary utility, etc.)
- Wood chips for both biomass boilers and playgrounds
- Wood pellets
- Animal bedding
- Soil amendments
 - Compost
 - Mulch
 - Bi-char
- Landscaping timbers
- Pallets and pallet shook
- Mass timber (cross-laminated timber, cross nailed timber)

Firewood has one of the cheapest business entry costs, and can be sold locally as well as transported and sold to buyers in nearby towns and distributors in more distant urban locales. The challenge for sellers is minimizing handling costs. Equipment costs are among the lowest of all value added products. Scaling up and including kiln drying for firewood offers opportunities for significantly increasing production totals, and while most local firewood contractors rarely engage in marketing beyond their home counties, the demand appears high nonetheless. The Watershed Center's pest-free commercial firewood bundling business has made clear that a successful firewood business can be operated in a rural locale, and their work along with that of

the Sierra Institute indicates that additional demand is available to support new businesses, especially with cooperative sales and marketing.

Wood Chips can be used to supply biomass-powered boilers to heat public institutions and for use in playgrounds. The Sierra Institute is working with public institutions across Plumas County to encourage replacement of fossil fuel boilers with woody biomass boilers. With California Energy Commission support, Sierra Institute is building one of the first small-scale combined-heat and power biomass systems for Plumas County that will utilize wood chips for fuel. The Watershed Center has been working with CAL FIRE and the CA Dept. of Corrections on replacing boilers at Conservation Camps around the state, including designed projects in Trinity and Modoc Counties. A key factor for incentivizing conversion to biomass heating systems is unstable propane prices and a lack of access to inexpensive natural gas in rural remote areas. To expand chip market opportunities, the Sierra Institute has launched work with a business that markets playground chips to urban users. Total chip demand has yet to be identified, but, like other products, success will be determined through market development.

Like all wood products, successful production increases must be accompanied by increased market development. Entry costs for chip production are moderate if second-hand wood chippers are used, although some boilers require a consistently sized clean chip that requires different chippers and screening equipment to remove fines and bark.

Wood Pellets was one of the first products examined by the Sierra Institute as part of co-product development at its wood utilization campus. The Watershed Center has worked to bring existing pellet manufacturers from Oregon, Arizona and Colorado to California with the opportunity of co-locating at existing sawmills and new forest product enterprises.

There is an increasing demand for pellets, locally, regionally, and internationally, with projections suggesting a dramatic increase in the coming years due to concerns associated with continued fossil fuel use and climate change. Production of wood pellets from California forest material can prove carbon positive through co-firing with fossil fuels and offsetting forest biomass that would otherwise be burned in a mega-fire or in piles in the woods. Entry costs for pellet production are high, and in a step-wise manner proportional to production totals. Higher production requires increased capital investment. While one operation can relatively easily produce 50,000 tons of pellets, entering the international market will require considerable investment of time to develop partnerships with buyers, along with investment in facilities that can produce a half million tons in order to be considered a serious supplier. In addition to capital costs, a key barrier to entering the international market involves trans-shipment; one consultant to the Sierra Institute suggested the West Sacramento Port will require a \$25 million upgrade to efficiently handle pellets. California could become a leading player in the pellet market, but considerable investment will be needed, both for development of pellet production facilities and in port upgrades. Pellet production offers opportunity to dramatically increase utilization of low-value forest material with an added CO₂ offset.

Pellets, like firewood and other wood products, would benefit from development of multiple production sites and cooperative business structure development. In this way, capital costs, risks, and community benefits can be spread among a number of producers, rather than development of a single large facility. Pairing pellet production with development of combined heat and power (CHP) facilities under SB1122 offers opportunity for dramatically improving CHP efficiencies and securing co-product revenue that can shift economic viability of these small CHP facilities.

Mass Timber -- Mass timber refers to engineered wood products that are structurally sound and much lighter than the concrete and steel they replace in building construction. Mass timber products include cross-laminated timber, cross nailed timber, and glue-laminated timber, to name a few. Mass wood's carbon benefit comes not only from the avoided CO₂ from not using concrete and steel, but from its storage of carbon in wood building product.

Cross-laminated timber (CLT) is made up of cross-layered and laminated lumber that offers superior structural strength. Recent blast testing performed by the U.S. Department of Defense, WoodWorks, Softwood Lumber Board, and the U.S. Forest Service showed mass wood to have "acceptable levels of damage under significant explosive loading." Results will "expand use of wood solutions for Department of Defense applications and other blast-resistant construction."² Mass wood structures also have inherent ductility, which allows them to dissipate energy when faced with the sudden loads of an earthquake. Sierra Institute is working with a CLT manufacturer to establish the first production facility in California at its Crescent Mills wood utilization yard. This manufacturer is confident that a strong market for CLT will emerge in California given the need for seismically safe buildings and from the need to turn wood from California's forests into value-added products.

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This review of wood products is not intended to be complete with respect to the type of products or the range of possibilities. It is offered to reveal ongoing work, real opportunities, and the need for additional work and investment in these and other products to advance community-scale wood utilization business opportunities.

In the next stage of business planning and development, Sierra Institute and Watershed Center seek partners and contractors to work with to conduct more detailed market analysis and initiate market development associated with some of the above and potentially other products. For such work to be community-scale it will require community responsive organizational involvement or oversight to be successful. Whether it is through Sierra Institute and Watershed Center or other community-based organizations, support is needed for detailed market analysis and market development at the community scale for this work to succeed and rural communities to benefit. Additionally, further development of products requires support for exploration of cooperatives to leverage single product development at multiple rural sites.

² Woodworks news release on Cross-Laminated Timber product testing, 10/14/2016.

The following scope of work is complementary to existing work products completed by The Beck Group for the State of California and the U.S. Forest Service, focusing on market analysis and development of well-suited rural community-based wood product enterprises. The following are some of the specific tasks that must be completed to develop the needed “road map” of opportunities to further advance community-scale work.

Task 1: Conduct literature and web search by products

- Identify product retailers, wholesalers, and brokers
- Characterize overall market characteristics for specific products (e.g., total demand, product specifications, price points, locations, etc.)
- Begin developing list of primary and secondary key contacts for further investigation

Task 1 deliverables:

- Product-by-product short profiles (one to two pages for each product)
- Preliminary contact list

Task 2: ID advisors, vet literature and web search results, and compile key contact list

- Work with partners to identify and expand lists of key contacts
- Vet literature and web results with advisors and identify additional data gaps

Task 2 deliverables:

- Completed key contacts list and data gaps

Task 3: Develop interview template for key contacts

- Identify and seek information regarding specific businesses, agencies, and individuals participating in current markets (retailers, wholesalers, and brokers)
 - o Names, locations, market relationships, current and past producers, price points, partnership potentials, etc.

Task 3 deliverables:

- Completed interview template/s
- Preliminary information regarding specific businesses, agencies, contacts by markets

Task 4: Conduct key contact interviews (email correspondence, 10-30 phone calls, and in-person meetings where possible), followed by secondary interviews with new contacts based upon primary contact recommendations (10-30 additional conversations)

- Product retailers, wholesalers and brokers
- Potential cooperative producers or cooperative opportunities

Task 4 deliverables:

- Completed interview transcripts and/or notes
- Compilation of key contacts including: name, company or affiliation, contact info, relevant notes regarding market role (producer, retailer, wholesaler, broker, etc.)

Task 5: Report on research and interview findings

- Synthesize findings

- Work with partners to identify most relevant findings and “best fit” products and appropriate cooperative ventures

Task 5 deliverables:

- Completed product-by-product market profiles with discussion of market potential
- Final list of key contacts

The Sierra Institute and Watershed Center will continue to advance work on their respective wood utilization campuses to develop businesses that can work locally as well as advance work that can be scaled up regionally with other community-based groups. The effort to involve and help other community-based groups will however determine the overall success of this work and successfully linking forest restoration work with the rebuilding rural forest community economies.

We would be remiss if we did not mention the challenge of reuse of abandoned mill and industrial sites in rural areas. The vast majority of abandoned industrial properties remaining from sawmill closures are contaminated. Common contaminants found on rural brownfields sites include total petroleum hydrocarbons (known as TPH), arsenic, dioxins, pentachlorophenol (PCP), and polychlorinated biphenyls (PCB). While these properties are often ideal for community-scale biomass and wood utilization projects, along with serving as emergency landings for trees removed from forests, contaminated properties represent a land mine of liability and complex regulatory process that challenge the most skilled or highest capacity organizations, as well as a threat to workers. Regulatory agencies have too little flexibility in their processes to stimulate and support clean-up and re-use of these sites.

While innocent landowners and “prospective purchasers” of brownfields in urban areas of California can qualify for some liability protections under the California Land Reuse and Revitalization Act, brownfields that do not lie within an incorporated city, or in an area surrounded by cities with a population of 100,000, are ineligible for the program. Owners and managers working on land in unincorporated areas can pursue protections through a Prospective Purchaser Agreement with DTSC, but agency requirements often exceed those that most community-based groups have the capacity to address. For example, the requirement of “financial assurance” for site assessments, cleanup planning, site cleanups, and paying for DTSC’s oversight costs almost guarantee that DTSC will not be notified with rural brownfields use, because community-based groups and under-capitalized business will not qualify and, as a result, will be stopped from re-development. Failure to notify and engage oversight agencies may facilitate site work moving forward in the near term, but has the potential to threaten projects and, in the long-run, worker health and safety.

Additional work is needed to address liabilities associated with these sites so remediation can take place and communities can develop the needed options for storing dead trees, and advancing wood utilization projects and community redevelopment efforts.