

Cost-Effective Tree Removal and Utilization Strategies to Address Invasive Species Attacks

Introduction

Several invasive forest pests, such as the Asian Long-Horned Beetle (ALB) and the Emerald Ash Borer (EAB), were likely introduced to the U.S. in urban areas. The arrival of invasive pests in an urbanized setting can lead to devastating results for both the municipal and rural forests of a region. Costs of tree removal and disposal, loss of property value, decrease in aesthetics, and reduced environmental services are a few of the negative consequences of an invasive species attack. One strategy to cope with the introduction and spread of invasive species is by implementing cost-effective tree removal and utilization options. By finding cost-effective and creative ways to utilize products from tree removals, communities can often lessen the economic impact of the pest's damage, provide local wood resources for needed projects, stimulate community interest in recycling and reuse, and strengthen local wood products industries.

Components of a Cost-Effective Tree Removal and Utilization Plan

There are numerous important components—often viewed as “challenges”—that communities and municipal tree managers must address to successfully remove and use trees impacted by invasive pests. The following is not intended to be an all inclusive list of these components but rather a starting point for discussions by all parties involved in municipal tree care.

- *Location:* Although invasive tree pests can sometimes spread quickly by natural and human-induced means throughout “traditional” forested ecosystems, the first recorded infestations are generally in populated or urbanized areas. These urban forests are also typically the focus of coordinated removal/eradication efforts. In natural forests, utilization efforts are generally more straightforward and should be targeted at working in cooperation with the existing forest products industry. The forest products industry does not typically operate in urban forests, making organizing and implementing utilization much more difficult in these areas. Due to the unusual skills and partnerships required for successful urban wood utilization, this specialty is the major focus of this publication.
- *Inventories:* Tree inventories in urban areas often lack the scope and specificity needed by wood-using industries to set-up an effective utilization program. With a few extra data points collected in the course of a regular tree inventory, a community can have a much stronger understanding of the potential markets for the trees they remove. Inventories also provide long-term, ongoing data for utilization of “baseline” tree removals, and give immediate and needed information when communities are pushed into crisis mode from a particular forest health threat.

In addition to standing trees (“green wood”), urban areas contain large quantities of discarded “brown wood” such as old pallets, used wooden shipping containers, and construction and demolition waste. Up-to-date inventories of both green and brown wood provide wood-using industries a snap-shot of available resources which aids in decision-making and utilization possibilities. Also, inventories of potential *users* of wood residues and the types of residues they process (ground green and brown wood chips as a biomass energy source for example) are important and can play a valuable role in implementing a utilization program.

- *Existing markets:* Most timber sales in rural areas involve multiple tree species. This “product variety” enables a range of potential buyers and markets to be interested in the sale. In urban areas, the availability of a single species (such as ash in the case of EAB) is more the norm. Single species utilization programs are more difficult to implement since the number of potential users and markets is limited. Also, the market issue is magnified if the single species is currently not “hot” and has a depressed price. However, this problem can be minimized by pursuing smaller and/or local markets or by including additional species in sales. Developing industry partners *before* a forestry crisis can also be helpful. The processor that handles a variety of removed municipal trees on a regular basis is also one who is likely to be an experienced and willing partner when more intensive removals are required.
- *Scale:* Urban areas, in particular, present a challenge for collecting wood residues. Systems which rely on single logs being picked up from a variety of areas are inefficient and have little chance of being successful over the long term (unless the logs are a specialty product such as veneer, a potential, but uncommon, urban wood product). Infrastructure has to be developed to allow for residues to be collected, sorted, and merchandised as efficiently as possible from a variety of public and private ownerships.
- *Timeline:* Often, the timeline set for tree removals is quite short once an infestation is discovered in an area. This leaves little time for arranging utilization options once removing trees and clearing debris becomes top priority. Utilization programs have the best chance of success if much of the early groundwork (finding industry partners, organizing collection and transportation, conducting inventories, etc.) is completed as much in advance as possible.
- *Expense:* The tree removals, wood disposal, and replanting associated with an invasive species outbreak create huge economic burdens for affected communities. This often makes “one-source solutions” appealing to communities when one company is willing to remove trees and dispose of the residue. At best, residues are generally utilized at a very low value in these scenarios. Also, “one-source solutions” might ignore other cost-effective and creative options for higher-value utilization that could further lower the disposal costs. A benefit and cost (B/C) analysis of utilization versus non-utilization scenarios is a useful tool in evaluating the economic impact of an invasive species outbreak.

- *Transportation:* High fuel prices and congested traffic in urban areas make transporting loads of wood difficult and expensive. Additionally, in most cases, few companies in urban areas have the equipment necessary to lift and transport logs and related products.
- *Community support:* Community leaders are often short-staffed and struggling with tight budgets. Asking them to develop and/or incorporate new ideas for how they dispose of wood waste is often difficult, even if it will result in savings for the city. In many cases, communities don't care what happens to the wood, as long as it is removed from public areas in a timely manner.
- *Local industry support:* Large wood products industries may not be interested in salvaged or reclaimed wood. They usually have their own reliable sources for wood resources, are wary of metal contaminants and poor log quality in urban trees, and are hesitant to try a new untested source. However, small urban-based wood product businesses can be quite supportive of an urban wood utilization program. It is important to survey many different types (and sizes) of local industries to find successful partnerships.

Strategies for Developing a Cost-Effective Tree Removal and Utilization Plan

Once the components—or challenges—of developing a cost-effective tree removal and utilization plan are understood, the next step is to develop a set of strategies. The following strategies are based on interviews, focus groups and personal experiences encountered in the Midwest, primarily as a result of the spread of the emerald ash borer. Additional strategies might be appropriate for site specific situations.

- Contact local stakeholders immediately to develop a thorough outline of needs, available resources, limitations, partners, and timelines. Some major groups to include in discussions include: State Department of Natural Resources staff (including wood products and community forestry specialists), State Department of Agriculture staff (including pest regulatory personnel), U.S. Department of Agriculture staff (including the State and Private Forestry branch of the Forest Service and the Animal Plant Health Inspection Service), University Extension, foresters, wood industry representatives (including large and small sawmills, local cabinet and furniture makers, biomass energy facilities, firewood, mulch, and other wood-based industries), non-profits and community organizations (Resource Conservation and Development Councils, Conservation Districts, environmental groups, etc.), solid waste planning and disaster/homeland security planning groups, recycling centers (which might already collect wood residues or relate good experiences in collecting and transporting residues in urban areas), tree care companies, city managers, and others.
- Develop a list of potential wood processors and survey them to gauge interest. Be sure to include industries from throughout the region on a variety of different

scales. State-wide wood products associations and manufacturers of processing equipment (portable mill manufacturers for ex.) are excellent sources in helping to compile a list of processors. Ideally, plans should allow for flexibility, creativity, and allow for wood to be utilized at its highest value. Some examples of industries include:

- Large scale/lower value – biomass energy, pulp and paper
- Small scale/high value – small mills, woodworkers guilds, small cabinet and furniture makers
- Varying scales/lower value – firewood (w/restrictions), mulch, bedding, soil amendments

Keep in mind that it might be most appropriate to use a number of different partners, given that most will only have use for a specific type of wood residue.

- Survey interested wood product producers further to gain idea of specifics. Develop contact lists (directory) to give to municipalities, tree service firms and other generators of wood residues. Be sure to include information on capacities (what types of processing and/or transportation can the business handle?), needs (what species, quality and quantity of wood are they interested in?), location, contact information, etc.
- Analyze opportunities to use the removed wood in new and/or alternative markets. For example, a local or regional study of boilers, and their timeline for replacement, might reveal an opportunity for using woody biomass as an energy source in a here-to-fore unexplored market. Another example is developing a target market and “branding strategy” for one or more of the removed species (i.e., “salvaged sycamore” for specialty millwork and paneling products).
- Use wood utilization, where appropriate, as a means to reduce tree removal costs. For example, communities that contract out their tree removals might get reduced bids/rates if arborists don’t have to transport and dispose of wood “residues” (i.e., saw logs). This is something communities should ask about when seeking bids for tree removals.
- Create collection yards for wood residues (use existing industry or municipal yards, if possible). Wood collection yards have proven to be an effective way to collect infested wood harvested by various groups into one accessible location where it can be sorted, processed, and merchandised. These yards may also play a regulatory role (as “marshalling yards”), enabling state and federal officials to contain large amounts of affected material and inspect finished products efficiently.
- Don’t underestimate the importance of developing methods for sorting wood residues. Many good public-private partnerships have ended when communities regularly provided industries with types of wood that they could not easily

process or market (logs too short, undesirable species, etc.). When developing any partnership, be sure to clearly identify who will have primary responsibility for sorting the wood, what types of wood/quality standards will be acceptable, and what will happen to the lower value wood.

- Create effective compliance agreements and safe avenues for moving clean wood products by encouraging ongoing discussions between industry and federal and state regulatory agencies.
- Create a strong educational/communication plan. There can be many misconceptions about the dangers of using infested trees. Conduct outreach to educate governments, industry, wood generators, homeowners, and potential buyers of wood products about the safety—and risks—of products and use of compliance agreements. Additionally, both wood generators and wood processors may need additional training on how to network, work together effectively, and safely process the material.
- Train arborists, tree removal crews, and local wood processors on proper felling and bucking of trees (with safety being the number one consideration). This training is important because traditional urban tree removal practices are not focused on maximum value utilization, or with specific end-products in mind such as saw logs.
- Conduct a tree inventory. Many communities have developed a “street tree inventory” which often describes the location and health condition of trees by species. However, more detailed inventory data is useful in attracting wood-using industries that are typically not “active” in an urban setting. In addition to species and health condition, communities should consider collecting the following data: tree diameter (DBH), tree height, height to base of live (or dead) crown, total merchantable saw timber log length, number of “branch logs,” saw log grades, accessibility of merchantable wood, and distance to nearest hazard. Also, as noted above, an inventory of “brown wood” resources (wood residues) complements a street tree inventory by painting a bigger and more complete picture of wood resources available in a community. Examples of “brown wood” include discarded pallets and crates, building construction debris, and residues from wood product manufacturers.
- Support growth of locally driven markets for urban wood and build public demand for products. Many communities and non-governmental organizations have established recycling and re-use centers. These centers can be the focal point for making urban wood products accessible to the general population, and in turn, stimulate production of these products by local businesses. Another strategy is for communities to use locally produced wood products (flooring and paneling as examples) from local “tree take-downs” in community buildings and other public spaces. Projects of this nature can play an important role in capturing the interest and support of a community.

- If possible, fund demonstration projects to showcase community utilization projects. While these types of projects may require outside funding, the successful partnership of a city and a portable mill, or the installation of a reclaimed wood floor in a city building can go a long way in showing local potential. Many communities and industries may be willing to participate, once they see that it can be done. Non-profits, community organizations, and artisan/woodworker guilds may be key partners in this type of project.
- Facilitate ongoing dialogue between producers, processors, regulatory agencies, and recycling centers by creating strong networking systems. This may be done by designating one organization or coordinator to be a central “matchmaker” (clearing house) helping communities find suitable industries and vice-versa. Alternatively, a web or e-mail-based communications system could be set up to increase communications between these groups.
- Learn from the experiences of other communities. Study successful examples of community wood use and see how these might be implemented in your own municipality. Talk to industries that successfully process urban wood to find out what makes their operations run profitably. Consider cooperating with other nearby communities in your region to share some of the responsibilities for collecting residues and dealing with partners.
- If possible, find ways to link profits or savings generated through wood utilization to enhanced public forestry programs. Public response to “full circle” urban forestry (when dead trees are recycled to help fund more tree plantings) is generally very positive and can bring about good community response in an otherwise negative situation.

Additional Information

In addition to the above strategies, there are other excellent sources of information to help communities, municipal tree managers, and others implement cost-effective tree removal and utilization options to address invasive species attacks. (An added benefit is that these strategies can produce positive results for communities long after the invasive species situation has passed).

The Ash Utilization Options Project at the Southeast Michigan RC&D (funded by the USDA Forest Service Wood Education and Resource Center) has an excellent website at <http://www.semircd.org/ash>. The website highlights demonstration projects, training sessions, an inventory program, and education and outreach efforts that the RC&D Council has developed to help communities and businesses develop value-added products from trees removed in EAB eradication programs.

A number of published resources, assessments and guides are also available. A sample of these items include:

Utilizing Municipal Trees: Ideas from Across the Country (Bratkovich, USDA Forest Service, 2001); <http://www.na.fs.fed.us/spfo/pubs/misc/umt/>.

Recycling Municipal Trees: A Guide for Marketing Sawlogs from Street Tree Removals in Municipalities (Cesa, Lempicki and Knotts, USDA Forest Service, 2003); http://www.fs.fed.us/na/morgantown/frm/cesa/rmt/rmt_index.html.

Harvesting Urban Timber (Sherrill, 2003);
<http://www.harvestingurbantimber.com/>.

Urban Tree and Woody Yard Residues: Another Wood Resource (McKeever and Skog, USDA Forest Service, 2003);
<http://www.fpl.fs.fed.us/documnts/fplrn/fplrn290.pdf>.

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