Reclaiming Wood Products From the Urban Forest

Edith Makra
IL EAB Wood Utilization Team
and
Metropolitan Mayors Caucus
Overview

- Reclaiming wood products
  - Supply
    - Measuring urban forest timber
  - Demand
    - Markets

- From tree to finished products - “links in a chain”
  - Study each ‘link”
  - Commercial arborist’s role

- Efforts to Advance urban wood
Trees are valuable over their lifetime
After decades of giving....

Full Circle Stewardship of Urban Forests - from seed to sawdust

2.3 yds$^3$

$129$

delivered
The time is right for urban wood markets

- Disposal of wood is expensive and regulated
- Consumer demand for local and sustainable products
- Ample supply of sufficient quality
- Invasive pests – emerald ash borer will impact supply and public awareness
- Unique properties and a compelling story
URBAN WOOD SUPPLY
National picture of lumber potential

200 million cubic yards of green waste

3-4 billion board feet of lumber

25% of 14 billion consumed in U.S.

30 million cubic yards of logs can be milled

Graphic courtesy of Sam Sherrill, author of *Harvesting Urban Timber* (2003)
The volume of urban tree and woody yard exceeds the amount of wood harvested from US National Forests!

Source: McKeever and Skog 2003
How much lumber is out there?

Ann Arbor Urban Forest Inventory & Saw Timber Evaluation:
(MacFarlane 2007)

- Urban tree species abundance
- Tree health
- Canopy cover
- Saw log volume, quality & accessibility
- Biomass estimates
Ann Arbor Urban Forest Inventory & Saw Timber Evaluation

Grade Lumber - 1 & 2

Grade (character wood) & Pallet Lumber – 3

Fuel Wood – 4 & 5

Factory grade 1 (code = 1)

Position: Upper log
Size: Length 12', diameter 14' at small end
Straightness: Straight
Soundness: Less than 5% of final grade free length clear from knots or defects
Cuttages: Less than 3% of final grade free length clear from cuttages

Factory grade 3 (code = 3)

Position: Upper log
Size: Length 12', diameter 14' at small end
Straightness: Straight
Soundness: Less than 5% of final grade free length clear from knots or defects
Cuttages: More than 3% of final grade free length clear from cuttages

Local use class (code = 5)

From Rast et al. 1973

A 11%-inch log 10 inches in diameter at the small end. It does not have defects that would render it a Factory Log. Although it is sound, several knots or defects in this construction class.
Ann Arbor Urban Forest Inventory & Saw Timber Evaluation Results

Accessibility to urban saw timber expressed as a percentage of merchantable volume per acre of differing grade within urban land use/land cover classes

<table>
<thead>
<tr>
<th>FIA grade</th>
<th>High Intensity Urban</th>
<th>Low Intensity Urban</th>
<th>Parks &amp; Golf Courses</th>
<th>Roads and Paved Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19.8%</td>
<td>35.7%</td>
<td>23.9%</td>
<td>20.7%</td>
</tr>
<tr>
<td>2</td>
<td>13.6%</td>
<td>28.8%</td>
<td>12.2%</td>
<td>45.3%</td>
</tr>
<tr>
<td>3</td>
<td>15.65</td>
<td>45.3%</td>
<td>7.8%</td>
<td>31.2%</td>
</tr>
<tr>
<td>4</td>
<td>11.3%</td>
<td>6.3%</td>
<td>16.1%</td>
<td>66.2%</td>
</tr>
<tr>
<td>5</td>
<td>20.1%</td>
<td>41.8%</td>
<td>6.9%</td>
<td>31.1%</td>
</tr>
<tr>
<td>All grades</td>
<td>17.3%</td>
<td>38.5%</td>
<td>9.9%</td>
<td>34.2%</td>
</tr>
</tbody>
</table>
Total Volume of accessible saw timber in the 13 county area estimated to be about 288 million board feet.

That is equivalent to approximately 30,300 semi truck loads of lumber.
2010 Tree Census
a.k.a  

1,400 1/10acre sample plots
4,071 total square miles surveyed

Collected data on species, size and land use type.

+ Added measurements and evaluations for urban timber estimates
2010 Tree Census – Chicago Metro Area

- Trees over 12 dbh were evaluated
- Number of log lengths at least 9’ clear of defect
- Access for harvesting
- **Easy  Moderate  Difficult**
- Based on:
  - ease of felling with minimal risk
  - equipment accessibility
2010 Tree Census Findings – The Trees

- 88% of logs are Merchantable Species
  - 51% of logs are Red and White Oak
- Total board feet for all grades & species
  - 1,222,075,000 BF
  - Remember annual consumption is 14 billion bf
- Known 1% removal rate annually (12,220,000 BF)
- 73% of logs rated *Easy* or *Moderate* access
- 40% of all evaluated trees have at least 1 merchantable log
Need to Standardize Urban Timber Assessments

- Proposed coordination:
  - with *i-Tree*
  - Traditional foresters
  - Primary forest products industry

- Watch for new ANSI arboricultural standards for harvesting!
POTENTIAL DEMAND FOR URBAN WOOD
Wood Certifications and Demand

- Demand for ‘green building’ a.k.a LEED Certification growing
- Certified (FSC) lumber earns LEED points (so does bamboo…)
- Urban wood can earn points
- Certification of urban wood not yet successful
Uses “emerald ash board”
But not LEED certified
Municipal Demand for Green Products

- Most familiar with urban wood opportunity
- Best public sector managers of the urban forest
- Opportunity to collaborate with commercial sector
Public Sector Demand for Green Products

Park District Survey
- 83% are purchasing green

  Product attributes considered in purchasing
- 89% consider recycled materials
- 50% consider *local* materials
- 83% would buy green if more expensive – depending

Municipal Survey
- 27% consider recycled or certified (EPP)
- 40% consider *Local*
SCHOOLS
Hottest Area for Green Building
Urban Wood Trending in Restaurants
LINKS IN THE CHAIN

Making it work
Turning urban trees into products involves the entire wood use chain

- **Arborists** – fell trees, harvesting logs
- **Sawyers** – mill logs into lumber
- **Woodworkers** – build wood products from lumber
- **Intermediaries** – specify and sell wood products
- **End users** – buy finished wood products
Arborists first vital link

- Two paths from felling to products
  1. Own tree into table
  2. Sell or provide logs for urban lumber

- Issues in common
  - Assessment of logs
  - Safe felling
  - Felling & storage to preserve log quality
  - Cost or savings?
1. Own Wood

Turn Ms. Jones tree into flooring

- Sell service to customer
- Municipalities may want some of their own lumber
- Evaluate tree to match expectations with quality, volume, cost
- Coordinate with sawyer & woodworker at time of sale
- Transport to sawyer or bring portable mill to job site
- Job may come from intermediary
2. Selling or provide logs for urban lumber

Solve the challenge of felling, aggregating, storing

- Assess trees while standing
- Felling – see “Game of Logging”, etc. training
- Minimum 9’ log length
- Transport whole logs
- Storage off the ground, protected, short term
- Develop relationship with sawyers
- Few sawyers pay/ may share lumber
- Disposal alternative
Sawyers - Primary Wood Products Manufacturers

- Seek out ‘thin kerf mills’ a.k.a. portable
- Fears about imbedded metal – concern for stationary mills
- Skill involved in maximizing yield and character
- Know use for wood before milling
- Kiln or air-dried
- May buy logs, trade, or charge hourly for milling
- See state forestry agency for sawyer lists
Commercial Disposal

2005 SE Michigan Survey

Disposal cost = $8.8 million yr for private industry
Municipal costs unknown
28% of collected wood is landfilled
Woodworkers secondary wood products manufacturers

- Unfamiliar with urban wood
- Can best take advantage of green market preference
- Inconsistency with urban wood supply is an issue
- Value of unusual species – box elder, Siberian elm, black locust
- Character wood
- Seek out woodworker associations
Don’t chip that tree. Reclaim it!

Did you know that Southeast Michigan’s dead urban trees could produce almost five million board feet of lumber each year? Unfortunately, trees removed from our cities are usually fated for the chipper. Instead, by saving and recycling the best logs, our partners create a wide variety of remarkable green products.

Purchasing lumber or other products from Urbanwood does more than give you beautiful, high-quality wood. Urbanwood partners make smart use of local resources. Our network of local sawmills turns dead urban trees into products that bring lasting value and exceptional character to your home.

Urbanwood products: a sustainable choice that supports communities in Southeast Michigan.
Rising from ASHES:
Furniture from Lost Trees
August 27 - Spring 2000
Rolling Dresser
www.dreeben.com

Zipperback
www.fenninger-design.com
Intermediaries specify and sell urban wood products

- Architects and interior designers
- Distributors, wholesalers and retailers
- Urban wood needs to become recognized in building standards and certification systems
- Lobbying FSC to include urban wood in certified lumber
- Flooring and millwork could create demand
End Users ask for and buy urban wood products

- Government and corporate procurement professionals
- Individual consumers
- End users drive market demand
- If bamboo can sell – why not urban wood?
- Consumers value the story
- Urban wood projects have earned good publicity
All the links can work together!

- **Arborist** – Village of Wilmette
- **Sawyer** – Horigan Urban Forest Products
- **Woodworker** – Bats By Buck
- **Intermediary** – Chris Canning
- **End User** – Wilmette Little League
Urban Wood Industry

Urban Hardwood Recovery
Milling and Kiln Drying Urban Hardwood Lumber in the Portland, Oregon Region

CITYBench
Furniture from the Urban Forest

HORIGAN UF
Urban Forest Products, Inc.

The Leader In Upcycling & Repurposing Of Trees Into Finished Wood Products

urban hardwoods®
Wood Chips for Fuel

- Bio-fuels – renewable energy potential in state with standards
- Price competitive with propane (Midwest) for heat
- Export market for chips for pelletized fuel – Scandinavia
- Flint, MI & St. Paul, MN power plants
- Suburban Chicago – Robbins failed
- US Forest Service – Wood Energy & Wood Innovation grants to drive markets for low-value wood products
Illinois Wood Utilization Team

- **Goal:** to encourage the harvesting and use of wood from urban and community trees felled in Illinois.
- **Ad Hoc Team:** 13 state and federal government and industry leaders
- **Network:** stakeholders from all links in the chain
- **Funding:** sporadic grants from U.S. Forest Service, Illinois Dept of Agriculture (EAB outreach)
● **Vision**: All wood from urban trees is put to good use.

● **Mission**: The Urban Forest Products Alliance advances the sustainable recovery and the highest and best use of the products of urban forests.

● For more info: *Urban Forest Products Alliance LinkedIn Group*
  
Thank you

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Addendum

URBAN WOOD RESOURCES
Who is Promoting Urban Wood

- State Forestry Organizations
- Regional efforts
- Full Circle Urban Forestry project
  - MO, IL, MI an WI
- VA did market study
- NC and CA had urban wood conferences

- Tree Care Industry Association
- Portable Sawmill Manufacturers
  i.e. Woodmizer
- Urban Forest Products Alliance
Recycling Municipal Trees
A Guide for Marketing Sawlogs from Street Tree Removals in Municipalities

Utilizing Municipal Trees: Ideas from Across the Country
Stephen M. Bratkovich
Earlier grant programs strongly supported urban wood

Currently coordinate quarterly web conference of northeast states

Now investing in market development for wood fuel and wood innovation

http://www.na.fs.fed.us/werc/
Wood Utilization Options for Urban Trees Infested by Invasive Species

Brian K. Brashaw
Robert J. Ross
Xipeng Wang
Michael C. Wiemann

MANUFACTURING AND MARKETING
EASTERN HARDWOOD LUMBER
PRODUCED BY THIN KERF BAND MILLS

DANIEL L. CASSENS

http://www.na.fs.fed.us/pubs/werc
Welcome to the Ash Utilization Options Project of Southeast Michigan

The Southeast Michigan RC&D Council is addressing the emerald ash borer infestation (EAB) in Southeast Michigan in a positive way by implementing an Ash Utilization Options Grant from the USDA Forest Service Wood Education and Resource Center.

Through demonstration projects, training sessions, a research program, and education and outreach efforts, the Council is helping communities and businesses to develop value-added products from urban trees removed due to the emerald ash borer and other causes.

Be sure to visit our resources page for helpful information, including links to urban wood use initiatives in other states, guides for homeowners, and resources for communities.

To stay informed about the Council's current activities, please visit our news page, see our events listing, or join our newsletter mailing list.

By turning this "waste wood" into products, we:

- create new recycling opportunities for ash and other types of wood waste,
- reduce the burden on local landfills,
- reduce the wood disposal costs for local communities,
- create new markets for high-quality, sustainable wood products, and
- create new economic opportunities for Southeast Michigan.
Are you a homeowner with a dead tree?

My Ash Tree is Dead... Now What Do I Do?

Are you in a community with many dead trees?

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

Community Urban Wood Utilization Planning Worksheet