## LINCOLN URBAN WOOD STUDY

In Lincoln, there has been intrigue in the feasibility of an urban wood business and development of an urban wood network. To answer these questions, a study was designed to understand the quality and production potential of urban lumber from city trees. The City of Lincoln provided 25 ash logs for milling by Nebraska Forest Service personnel on a hydraulic band sawmill. Cants for industrial lumber, rough lumber, and live edge slabs were the three products studied for value comparison. The milling time and quality for each piece of lumber from each log were recorded to gain insight into daily production potential and to compare time and effort in milling a board to its value.

### Findings

The lumber produced in the study was of higher quality than expected. Many of the observable defects on the surface of the log were eliminated when milled into slabs or rough lumber. The production costs for rough lumber and cants resulted in narrow profit margins. It should be noted however that the milling was done by personnel who do not work day-to-day with a sawmill. Experienced sawyers could increase the production rates and therefore the profit margins over what was observed in this study. Milling for live edge boards and slabs provided the greatest value opportunities. This study also helped us to understand the challenges facing a small sawmill operation. First, a skid steer was necessary to move logs around the mill staging area. The mill used in the study had hydraulic lifts to maneuver the logs onto the mill however without hydraulics, placing the large logs onto the mill creates an additional challenge. Finally, handling the heavy boards after sawing without equipment created a barrier. In order to efficiently mill lumber for this study, three people were needed at all times: 1 person sawing and 2 people moving logs onto the mill and lumber off of the mill.

## MARKETING THE PRODUCT

The key to making a business of urban lumber production is marketing the product: it is not what you can make; it is what you can sell. Developing a marketing strategy that emphasizes that the lumber is produced locally from urban trees has been successful in Wisconsin and Michigan. The Urban Wood Network provides a framework for developing urban wood marketing strategies and showcases states and businesses that have done so successfully. An important aspect of marketing urban lumber is to have a display area where customers can view each piece of lumber for its character and unique features. Developing the story of full circle urban forest management and using trees for their highest and best use once removed are keys to successful marketing.

### Additional Resources

The Urban Wood Network: http://urbanwoodnetwork.org/

Manufacturing and Marketing Eastern Hardwood Lumber Produced by Thin Kerf Band Mills by Daniel L. Cassens. Published by Purdue Extension.

Nebraska Forest Service Forest Products Marketing Guidebook

Drying Hardwood Lumber by Joseph Denig, Eugene Wengert, and William Simpson. Published by the USDA Forest Products Laboratory.

Business Management Practices for Small to Medium-Sized Forest Products Firms by Omar Espinoza and Robert Smith. Published by Virginia Polytechnic Institute and State University.



# URBAN LUMBER PRODUCTION

Communities across Nebraska are increasing the management of their community forests in anticipation of emerald ash borer. The removal of community trees, whether related to emerald ash borer or other tree management needs, leads to the inevitable question, "what happens to the wood?"

While some wood waste is converted into products like compost or mulch, the production of urban lumber represents an opportunity for entrepreneurs, artisans, and businesses to create valuable products for sale or for the creation of finished wood products.

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## Types of Lumber Products

Community trees often have a different form and structure than trees grown in forests. The "open grown" nature of community trees tend to produce larger canopies and shorter logs, especially the tree trunks. This can have an impact on the type of lumber products capable of being produced from community trees. The three categories for urban lumber are industrial, rough, and live edge/slabs.

### Industrial Lumber

Industrial lumber is large dimension lumber, called cants, that can be resawn into smaller pieces for pallets. It requires only four cuts and is therefore efficient to produce. However, a large volume of logs of the size and form necessary for cant production would be required and securing this supply from urban trees could be a challenge. Markets for cants are seemingly available. Industrial lumber is sold green and requires high production volumes to be profitable.

*Ash logs from the City of Lincoln.*

### Rough Lumber

Rough lumber is typically cut to 1-2" thicknesses and is sold with or without drying and/or planing or flattening. However, drying is necessary before it can be used in finished products. In traditional markets, sawing rough lumber from urban logs is marginally profitable. With the development of a local wood market, the value for this type of lumber could substantially increase. The Urban Wood Network (urbanwoodnetwork.org) has examples of businesses, municipalities, and states that have developed these markets successfully.

*Rough lumber after being cut.*

### Live Edge Lumber & Slabs

Live edge lumber is increasingly popular and sells for more than rough lumber. Live edge lumber is most commonly sold in 2" thick slabs but does include smaller dimensions as well. The size of the slabs can mean considerable time is spent air-drying this type of lumber. Kiln drying slabs is an option however the kiln operator should be proficient in drying to maintain the value of the slabs. Similar to rough lumber, developing a local wood market could increase the demand and the value for this style of lumber.

## Beyond Lumber

### Sawmill Equipment

There are a number of factors to consider when choosing a mill. Will you choose manual or hydraulic? A bandsaw, circle saw, or chainsaw mill? Consider the following when purchasing a sawmill:

- What size of logs will you be milling?
  - Many sawmills have log diameter and length limitations.
- How often will you be milling? How much lumber do you want to produce?
  - Hydraulics enable quicker turnaround.
  - Bandsaws and circle sawmills are more efficient than chainsaw mills.
  - Engine horsepower will also impact the efficiency of your mill.
- How much of the work are you willing to do yourself?
  - Hydraulics take the burden of labor off the operator.
  - What additional equipment is necessary to maneuver logs and lumber?
- Do you want to be able to move your mill between job sites?
  - Some mills are designed to be stationary while others can be trailer mounted.

*Portable sawmill cutting rough lumber.*

### Drying

Similar to sawmills, there are a number of options for lumber drying. Drying lumber is necessary to ensure a quality product and maximize the value of the lumber. Air-drying is the lowest cost option but also takes the most time. A 2" thick slab will take up to 2 years to air dry. Dehumidification kilns and solar kilns are relatively low investment options for drying however, kiln operation and drying time for both will vary seasonally. Traditional lumber drying kilns and vacuum kilns are two other options for drying lumber. Both dry much more quickly than the previous options.

*Dehumidification kiln drying rough lumber.*

### Sawmill Residues

Milling logs for lumber will generate slabs, sawdust, and bark. Bark typically does not accumulate in large volumes but it does come off during the handling and sawing of logs. There is not much market potential for bark unless it is chipped for mulch with other residues. Slabs could be sold to a commercial firewood processor depending on the volume available. They could also be chipped and sold as mulch. The most value recovery of mill residues will be in the slabs. Similar to bark, sawdust is also a low-quality residue. It is best used in composting or as a mulch.

*Slabs of wood to be used for lumber products.*

*Slabs of wood going through portable sawmill. Slab residue can be used as compost or mulch.*

**The Nebraska Forest Service: Improving lives by protecting, utilizing and enhancing Nebraska's tree and forest resources.**