Shelterbelt Utilization: Options beyond piling and burning

Great Plains Windbreak Renovation and Innovation Conference

July 24th, 2012
International Peace Gardens
Overview

• Purpose, type and design of shelterbelts

• Examples of utilization

• Utilization options and economics

• Developing a plan
Shelterbelt Types

For the purpose of this presentation the term shelterbelt includes the following:

- Yardsite
- Field
- Bluff
Typically shelterbelts are designed for a specific purpose:

- Temperature Regulation
- Snow Management
- Soil moisture evaporation
- Erosion control
Shelterbelt Design

- Future utilization is not usually a consideration in the planning, design, and species selection.
Continuation of a Shelterbelt

- What happens when the function of the shelterbelt exceeds the life expectancy of the trees?
## Life Expectancy of Trees

<table>
<thead>
<tr>
<th>Species</th>
<th>Life Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>European larch</td>
<td>100+ years</td>
</tr>
<tr>
<td>Tamarack</td>
<td>75 years</td>
</tr>
<tr>
<td>Norway spruce</td>
<td>75 years</td>
</tr>
<tr>
<td>White spruce</td>
<td>75 years</td>
</tr>
<tr>
<td>Colorado spruce</td>
<td>75 years</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>75 years</td>
</tr>
<tr>
<td>Scots pine</td>
<td>75 years</td>
</tr>
<tr>
<td>Eastern white cedar</td>
<td>100+ years</td>
</tr>
<tr>
<td>White oak (Bur Oak)</td>
<td>100 years</td>
</tr>
<tr>
<td>Green ash</td>
<td>75 years</td>
</tr>
<tr>
<td>European mountain ash</td>
<td>25 years</td>
</tr>
<tr>
<td>Golden weeping willow</td>
<td>50 years</td>
</tr>
<tr>
<td>White birch</td>
<td>30 years</td>
</tr>
<tr>
<td>Silver maple</td>
<td>100 years</td>
</tr>
<tr>
<td>Sugar maple</td>
<td>75 years</td>
</tr>
<tr>
<td>Manitoba Maple (Box Elder)</td>
<td>100 years</td>
</tr>
<tr>
<td>Little-leaf linden</td>
<td>75 years</td>
</tr>
<tr>
<td>White elm</td>
<td>30 years (200 were it not for Dutch elm disease)</td>
</tr>
<tr>
<td>Russian olive</td>
<td>50 years</td>
</tr>
</tbody>
</table>

Source: Canadian Forest Service
Continuation of a Shelterbelt

- A new plan for removal and renewal must be developed
Utilization Example #1:

- A young family purchased a home with mature trees on the lot/land
- Concerned about the dying trees and limbs falling on kids, pets, and buildings
- Talked with a neighbour and came up with a plan for the trees
- Trees would be taken down by the neighbour in return for the sawlogs
Utilization of Shelterbelt Trees

Trees can be separated by two utilization types:

- Firewood
- Sawlogs
Firewood

- The value of firewood is generally based on the BTU’s associated with a particular species

<table>
<thead>
<tr>
<th>Wood Species</th>
<th>Heat Value in M_BTU/cord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bur Oak</td>
<td>28</td>
</tr>
<tr>
<td>Tamarack</td>
<td>24</td>
</tr>
<tr>
<td>Birch</td>
<td>23</td>
</tr>
<tr>
<td>Ash</td>
<td>23</td>
</tr>
<tr>
<td>Manitoba Maple</td>
<td>19</td>
</tr>
<tr>
<td>Trembling Aspen (Poplar)</td>
<td>18</td>
</tr>
<tr>
<td>Jack Pine</td>
<td>17</td>
</tr>
<tr>
<td>Spruce</td>
<td>16</td>
</tr>
<tr>
<td>Balsam Fir</td>
<td>15</td>
</tr>
<tr>
<td>Willow</td>
<td>14</td>
</tr>
<tr>
<td>Cotonwood</td>
<td>14</td>
</tr>
</tbody>
</table>
Firewood

Typically sold by the cord
Firewood Value

• Low BTU’s = Low Value $80-$100 per cord
  • Willow, Cottonwood, Manitoba Maple, Poplar, Pine, Spruce.

• High BTU’s = Higher Value $125-$200 per cord
  • Oak, Ash, Birch, Tamarack (Larch)
Utilization Example #2:

• A 5 acre bluff of bur oak and green ash was planned for conversion from trees to crop land

• Landowner had a 3 year plan to clear and develop

• Replaced the bulldozer with a grapple skidder and hired a logger
The Results:

Firewood (70%)  
52 cords

Sawlog (30%)  
23 cords
• Stumpage for Firewood $5-$10 / cord

• Stumpage for Sawlogs $15-$25 / cord
The Results

• The three year plan was accelerated and the 5 acres were put into production the following year

• Landowner was paid

• Logger sold the firewood and sawlogs locally

• WIN WIN for both
Sawlogs

• **Length**
  - 6ft-8ft min.
  - 20ft-24ft max.

• **Diameter**
  - 10inch @ small end

• **Shape/Form**
  - Low amount of knots, rot, twist
  - Straight
Saw log Economics

- 2 cords yields 1,000 board feet of lumber
- 1,000bf can be sold as:
Rough Cut Kiln Dried Lumber
Installed Finished Flooring
Adding Value to Local Wood

- Sawlog sells for $200 /cord
- Milling, Drying, Machining into finished Product
- Sawlog value increases 22.5 times
  - From $400 to $9,000
Keys to Utilization

- Develop a Plan
- Consider the value of the trees
- Develop a utilization strategy
Having a Plan

Allows you to make informed decisions
Start with a Site Assessment
Identifies the species, volume, and utilization options
Identifies a Time Line
Presents options for utilization
Determines the value of the shelterbelt
Lower Value

Willow
Cottonwood
Manitoba Maple
Higher Value

Oak
Ash
Birch
Tamarack
Small Micro Forestry Operators exist
Can turn salvage volume into higher value products
May operate seasonally
Require local wood volume to operate economically
Other Products
• Have a plan

• Utilization is dependant species / quality

• Utilization supports the rural local wood economy