Forest Management for Small Woodlots

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Outline of today’s topics:

• Traditional Forest Management
• Crop Tree Management
Forest Succession

<table>
<thead>
<tr>
<th>Stage</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants Stage</td>
<td>First 5 years</td>
</tr>
<tr>
<td>Shrub Stage</td>
<td>6-25 years</td>
</tr>
<tr>
<td>Young Forest</td>
<td>26-50 years</td>
</tr>
<tr>
<td>Mature Forest</td>
<td>51-150 years</td>
</tr>
<tr>
<td>Climax Forest</td>
<td>150-300 years</td>
</tr>
</tbody>
</table>

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Forest Succession

- Partially driven by tree tolerance to shade

<table>
<thead>
<tr>
<th>Shade Intolerant (requires full sun)</th>
<th>Intermediate</th>
<th>Shade Tolerant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jack pine</td>
<td>Oaks</td>
<td>Sugar Maple</td>
</tr>
<tr>
<td>Red pine</td>
<td>White pine</td>
<td>Beech</td>
</tr>
<tr>
<td>Aspen – popple</td>
<td>Ash</td>
<td>Basswood</td>
</tr>
<tr>
<td>Paper birch</td>
<td></td>
<td>Cedar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Balsam fir</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spruces</td>
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<tr>
<td></td>
<td></td>
<td>Hemlock</td>
</tr>
</tbody>
</table>
Forest Succession

- Shrew
- Deer
- Grouse
- Robin
- Song sparrow
- Junco
- Warblers
- Grasshopper sparrow
- Meadowlark

Grass and forbs  Shrubs and saplings  Pole timber  Mature timber
Succession follows Disturbance

- Drought, insect epidemic
- Wildfires
- Agriculture (NLP and UP)

- Forest management = logging = disturbance
  - Planned disturbance
  - Outcomes predictable (somewhat)
  - Forest management activities are specifically chosen to regenerate desired species of trees
Forest Management

• Clearcutting
  – Apsen
  – (White, Red, Jack) pine
  – (White, Black) spruce
  – Oaks

• Shelterwood and/or Seed tree
  – Oaks
  – White pine
  – Spruce-fir
  – Northern hardwoods
Forest Management

• Single tree selection
  – High quality hardwoods

• Timber stand improvement
Forest Management

• Group or gap creation
  – hardwoods

Credit: Megan Matonis, Center for Systems Integration and Sustainability, Michigan State University

http://michigansaf.org/Business/MSAFguide-2010/1-5-Management.html
Forest Management

TYPES OF HARVEST

- **Clearcutting**
- **Patchcut**
- **Seed Tree**
- **Group Selection**
- **Shelterwood**
- **Single Tree Selection**

http://oregonforests.org/content/ask-forester
Income Opportunities

- Income from timber harvest itself
  - Depends on species and size of trees
  - and market availability/demand!!
- Aspen regeneration – decorative poles
- Gap creation – (rasp)berry growth opportunity
  - Ramps, violets, edible wild plants
- Firewood – tops usually left behind after timber harvest
- Game wildlife – benefit from branches on the ground
  - increase in sunlight = more ground vegetation
- Agroforestry – forest crop production under forest canopy
Crop Tree Field Guide

Crop Tree Management

- Reducing competition
  - Light
  - Water
  - Space
  - Nutrients
  - Carbon dioxide
  - Oxygen
  - Above ground
  - Below ground
Crop Tree Management

1. Identify goals
   - Timber production, habitat (game or non-game), recreation, enhanced view (aesthetics)

2. Develop crop tree criteria
   - Site quality important
   - Different for each forest stand (type)
   - 100 acres or less
   - Pre- or Non-commercial stands
Crop Tree Management

3. Inventory property / stands
4. Layout proposed treatment
5. Decide how many crop trees to release per acre
6. Decide which trees to cut to release crop trees
Crop Tree Management
Crop Tree Management
Crop Tree Management

- Crop trees identified
- Competing trees in brown
- Competing trees removed
Crop Tree Management

10-yr. Diameter Growth (inches)

Free-to-Grow Rating
Income Opportunities from Crop Tree Management

• Timber trees increase in value
• Wildlife – hunting or lease for hunt
  • recreation value non-game wildlife
    (birdwatching, personal value)
• Aesthetics – personnel or commercial view
• Trails – personal or commercial use
• Water quality – regional streams/lakes
• Use removed trees for – firewood, decorative poles, sign posts, pulpwood, chips for trails
Crop Tree Management

Example Crop Tree Criteria for:

- Timber
- Wildlife
- Aesthetics
- Water quality

http://forestandrange.org/planning/lsregion/management/croptreerelease.htm
Crop Tree Criteria for Timber

- Dominate / Co-dominant trees 25’ tall
- Healthy crown; large relative to dbh
- High value commercial species for area
- Expected longevity of 20+ years
- Species well adapted to site
- Limiting factors:
  - # of trees per acre for reasonable cost
  - Grow rapidly while maintaining characteristics that make them valuable (1-2 side release)
Crop Tree Criteria for Wildlife

Mast Trees

• Dominate or Co-dominant
• Healthy crown, large crown relative to dbh
• Hard mast producers favored
• Expected longevity of 20+ years
• Cavities, large broken branches ok
• Indicators of important mast producers:
  – Crown position
  – Species
  – Genotype
Crop Tree Criteria for Wildlife

Cavity Trees

• Mast producer = release, otherwise just keep
• Trees any species, size and crown position
• Dead, upper crown branches
• Cavities in main bole ok
• Expected longevity not important
Crop Tree Criteria for Aesthetics

- Species that produce attractive flowers or fall foliage
- Visible from roadways
- Adjacent to streams, waterways
- Longevity of 20+ years
- Unique trees
  - Branching
  - Bark
  - Tree shape

http://www.superiortrails.com/keweenaw-color.html
Crop Tree Criteria for Aesthetics

“Michigan’s Fall Color Lineup” – by Bert Cregg

- Sugar maple – gold/yellow
- Red maple – bright red
- Aspen (Popple) – bright yellow
- Red oaks – russet red
- White oaks – yellow or dusty red
- Sassafras – yellow to deep red
- Larch – bright yellow, needles drop
- Honey locust – bright yellow
- Bald cypress – russet red, needle drop
- Sweetgum – deep red to purple
- Redbud – bright yellow
- Tulip poplar - yellow
- Hickories – yellow

Link to article:
http://msue.anr.msu.edu/news/introducing_michigans_fall_color_lineup
Crop Tree Criteria for Water Quality

- Control non-point source pollution
- Absorb excess nutrients from runoff
- Slows runoff
- Groundwater recharge
  - Infiltration rates increase
- Stabilizes soil
Crop Tree Criteria for Water Quality

• Nutrient uptake most rapid in young, deciduous trees
• Red and white oak, red maple, quaking aspen absorb nitrogen well, to a point
• Basswood, yellow poplar, dogwood, red cedar
  – Calcium, phosphorous, potassium
  – Beech, red spruce, pines, hemlock - slower uptake
Visual Considerations

• Competing trees
  – Cut down?
  – Knocked down?
  – Remain standing (dead)?

• Park-like or not

• Mid-story treatment

• Fell during dormant season
Forestry Assistance Program
Forestry Assistance Program

• Foresters available to meet at no charge
  – Provide guidance
  – Referral service for professional providers
  – Internet search for “MDARD FAP”
  – Employed through local Conservation Districts
Natural Resources Conservation Service (NRCS)

- **EQIP** - Environmental Quality Incentives Program
- Forestry practices, including crop tree release may qualify for cost share
- Forest Management Plan (~100% cost share)
- TSI – Timber Stand Improvement
- Clearcutting to regenerate aspen/oak for wildlife
- Tree planting for wildlife

**Michigan NRCS Local Service Centers and Field Staff**
https://www.nrcs.usda.gov/wps/portal/nrcs/main/mi/contact/local/
Consulting Foresters and Timbermen

• Association of Consulting Foresters
  – https://www.acf-foresters.org/
• Michigan Association of Timbermen
  – http://www.timbermen.org
• Michigan Forest Products Council
  – http://www.michiganforest.com/
• Local Conservation Districts
  – List of service providers
Resources

• MSU Product Center
  – https://www.canr.msu.edu/productcenter/
  – “The MSU Product Center can help you develop and commercialize high value products in the food, agriculture and natural resource sectors.”
Questions?

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Illustrated Example
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Questions? Comments?

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