Managing Bottomland Hardwood Forest for Wildlife
aka “Desired Forest Conditions (DFCs)"

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On Behalf of the
Lower Mississippi Valley Joint Venture
Lower Mississippi Valley Joint Venture’s Desired Forest Conditions

Topics for Today’s Presentation:
- Overview of LMVJV
- Overview and Derivation of DFC attributes
- Overview of Management Recommendations
- Topics not covered but included in DFC Report
- Reforestation
- Inventory & Monitoring
What is the Lower Mississippi Valley Joint Venture?

- The LMV Joint Venture is a self-directed, non-regulatory conservation partnership that exists for the purpose of implementing the goals and objectives of national and international bird conservation plans.
LMVJV Conservation Objective:

*Lands**capes capable of supporting sustainable populations of priority wildlife.*
How do we manage bottomland hardwood forests for population sustainability?

Population Growth

\[ r = (b - d) + (i - e) \]

- \( r \): growth rate
- \( b \): birth rate
- \( d \): death rate
- \( i \): immigration
- \( e \): emigration

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</thead>
<tbody>
<tr>
<td>Growth Rate</td>
<td>10</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
</tr>
</tbody>
</table>
Population Sustainability is a Function of:

$$(\text{landscape quality}) + (\text{site quality})$$
Implications to Restoration and Management of Bottomland Hardwood Forests
Population Sustainability is a Function of:

\[(\text{landscape quality}) + (\text{site quality})\]
Population Sustainability is a Function of:

(landscape quality) + (site quality)

How do we manage for site quality to enhance wildlife habitat?

- Forest Composition & Structure
- Landscape Position & Wetness
Desired Forest Conditions to Enhance Wildlife Habitat

- Why do we need to define Desired Forest Conditions?
  - Explicit linkage between wildlife needs and structural attributes
Desired Forest Conditions to Enhance Wildlife Habitat

• Why do we need to define Desired Forest Conditions?
  ➢ Explicit linkage between wildlife needs and structural forest attributes

Defines Endpoint; Provide Guidance to Land Manager; Provides Basis for Evaluation
Desired Forest Conditions to Enhance Wildlife Habitat

What are the Desired Forest Conditions??
Look back In time….

Long history of forest management, but rarely have management prescriptions been explicitly linked to wildlife habitat needs via specific forest metrics.

2001 – National Wildlife Refuge System initiated Biological Reviews

*Biologists would say…”we need more Swainson’s Warbler habitat”….*

*Forester would say…”what does that look like”?*
Look back In time….

Long history of forest management, but rarely have management prescriptions been explicitly linked to wildlife habitat needs via specific forest metrics.

2001 – National Wildlife Refuge System initiated Biological Reviews

*Biologists would say…”we need more Swainson’s Warbler habitat”…*

*Forester would say…”what does that look like”?*

2002 – USDA Natural Resource Conservation Service asked the U.S. Fish and Wildlife Service for assistance in terms of how to manage extant blocks of bottomland hardwood forest being enrolled in the Wetland Reserve Program (WRP) with an emphasis on wildlife habitat.

**Joint Workshop in Vicksburg, MS – November 5-7, 2002**

A working group was formed to draft a white paper that addressed forest management as it related to enhancing wildlife habitat.
NRCS-WRP Forest Land Compatible Use Guidelines - 2004

--- DRAFT ---

<table>
<thead>
<tr>
<th>Target forest conditions</th>
<th>Conditions that may warrant management</th>
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<tbody>
<tr>
<td>0%-80% canopy cover</td>
<td>&gt;50% canopy cover</td>
</tr>
<tr>
<td>Basal area 70-90 ft²/acre (16-20 m²/ha)</td>
<td>Basal area &gt;100 ft²/acre (&gt;28 m²/ha)</td>
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<tr>
<td>60%-80% stocking</td>
<td>&gt;100% stocking</td>
</tr>
<tr>
<td>Vines in overstory on 40%-60% of inventory (cruise) plots</td>
<td>Vines in overstory on &lt;30% of inventory (cruise) plots</td>
</tr>
<tr>
<td>Super-emergent trees on 10%-20% of inventory (cruise) plots (4 to 6 super-emergent trees per acre)</td>
<td>Super-emergent trees &lt;5% of inventory (cruise) plots (&lt;1 super-emergent trees per acre)</td>
</tr>
<tr>
<td>Midstory canopy on 30%-60% of stand</td>
<td>Midstory canopy on &lt;20% of stand</td>
</tr>
<tr>
<td>Vines in midstory on 50%-70% of inventory (cruise) plots</td>
<td>Vines in midstory on &lt;30% of inventory (cruise) plots</td>
</tr>
<tr>
<td>Understory canopy cover on 40%-50% of stand</td>
<td>Understory canopy cover in &lt;30% of stand</td>
</tr>
<tr>
<td>20%-50% ground cover occupancy average across inventory (cruise) plots</td>
<td>&lt;20% ground cover occupancy average across inventory (cruise) plots</td>
</tr>
<tr>
<td>Cane present on 20%-10% of inventory (cruise) plots</td>
<td>Cane present on &lt;20% of inventory (cruise) plots</td>
</tr>
<tr>
<td>Regeneration of hard mast tree species (oaks and hickories) on 50%-70% of inventory (cruise) plots</td>
<td>Regeneration of hard mast tree species (oaks and hickories) on &lt;20% of inventory (cruise) plots</td>
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<tr>
<td>2 to 4 logs/acre that provide coarse, woody debris</td>
<td>&lt;2 logs/acre that provide coarse, woody debris</td>
</tr>
<tr>
<td>4 to 6 cavity trees (snags) &gt;4 inches dbh/acre</td>
<td>&lt;4 cavity trees (snags) &gt;4 inches dbh/acre</td>
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<tr>
<td>1 to 4 large &quot;dén&quot; trees or &quot;unsound cull&quot; trees per 10 acres</td>
<td>&lt;1 large &quot;dén&quot; tree or &quot;unsound cull&quot; tree per 10 acres</td>
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aka... Desired Forest Conditions – version 1
In 2004, the Lower Mississippi Valley Joint Venture Management Board created an inter-agency, inter-disciplinary working group to further investigate and address forest management as it relates to enhancing wildlife habitat.

*Lower Mississippi Valley Joint Venture’s Forest Resource Conservation Working Group*
In 2004, the Lower Mississippi Valley Joint Venture Management Board created an inter-agency, interdisciplinary working group to further investigate and address forest management as it relates to enhancing wildlife habitat.

Task Assigned by LMVJV Management Board:

The working group will strive to ensure that conservation actions and programs of Joint Venture partners reflect reforestation and forest management prescriptions and practices that sustain populations of priority birds and other forest-dependent wildlife in concert with sustainable forestry.
Desired Forest Conditions to Enhance Wildlife Habitat

Define wildlife species and habitat needs

What are the Priority Wildlife Species?

What are their habitat needs?

- Hard & Soft Mast
- Large & Small Cavities
- Standing Snags
- Dense Ground Cover
- Down Woody Material
- Structural Complexity
Explicitly link wildlife to structural attributes

Literature Review

Canopy Cover

Basal Area

Large (>35 cm d.b.h.) pine density (trees/ha)

Suitability index score

0 10 20 30

0.0 0.2 0.4 0.6 0.8 1.0

Basal area (meters squared/ha)

Suitability index score

0 50 100 150

0.0 0.2 0.4 0.6 0.8 1.0
Explicitly link wildlife to structural attributes

Series of Field-based Discussions
**Desired Stand Conditions:**

--- *Primary Management Factors* ---

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<th>Conditions that <em>may</em> warrant management</th>
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<tr>
<td>Canopy cover</td>
<td>60 – 70 %</td>
<td>&gt;80%</td>
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<tr>
<td>Mid-story cover</td>
<td>25 – 40 %</td>
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<tr>
<td>Basal area</td>
<td>60 – 70 ft²/acre</td>
<td>&gt;90 ft²/acre</td>
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<tr>
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<td>with ≥ 25% older age class</td>
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<td>Tree stocking</td>
<td>60 – 70 %</td>
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**Desired Stand Conditions:**
-- Secondary Management Factors --

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<td>Dominant trees</td>
<td>&gt;2 / acre</td>
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<td>Under-story cover</td>
<td>25 – 40%</td>
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<td>Regeneration (advanced intolerant)</td>
<td>30-40% of area</td>
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<td>Coarse woody debris</td>
<td>&gt;200 ft³ / acre</td>
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<td>Small cavities (&lt; 10” diameter)</td>
<td>&gt;4 visible holes / acre</td>
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<td>&gt;1 visible hole / acre</td>
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<td>Standing dead / stressed trees</td>
<td>&gt;6 stems / acre &gt;10” dbh</td>
<td>&lt;4 stems / acre &gt;10” dbh</td>
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<td>&gt;2 stems/acre &gt;20” dbh</td>
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Take Home Point:

DFC metrics represent forest structural attributes…

…that best describe wildlife habitat suitability
Desired Forest Conditions to Enhance Wildlife Habitat

What are the Management Recommendations?
Desired Forest Conditions

Goal: Develop structurally diverse forest, diverse in species, age, and diameter
Take Home Point: There is no “Silver Bullet” Rx

Treatments

DFCs

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Recommendations:

**Landscape-level (circa 10,000 acres)**
- That 70-95% of forest area be actively managed
- That 35-50% of actively managed forest meet desired forest conditions
- No more than 10% of landscape should be comprised of regenerating forest (clearcuts >7 acres)

**Stand-level**
- Retain snags and some stressed/dying stems for cavity retention and development
- Leave 2-4 tpa of species and individuals that will most rapidly attain dominant crown position
- Encourage proliferation of cane on appropriate sites
- Target a portion of most stands for regeneration of shade-intolerant tree species through silviculturally induced gaps
**Fundamental Objective:**

Implement silvicultural Rxs to attain, retain, and maintain desired stand conditions, while operating in a sustainable manner that produces quality timber products

**Operating Principles:**

• No rotation or cutting cycle, rather a 10-15 year evaluation cycle

• Primary and secondary factors are an average across the stand

• No definitive silvicultural Rx exists to guide stand development towards DFCs

• Multiple treatment entries are often necessary to achieve DFCs

• All silvicultural tools are available to the land manager to manage a stand towards DFCs
Complex, Multi-layer Forest Forest
Produced through variable intensity harvests
Tall, Emergent Trees

Small Cavities

Snags

Large Cavities

Coarse Woody Debris
In Closing....

• DFC attributes explicitly link wildlife needs to structural forest attributes

• DFC attributes are not intended nor expected to occur on every acre of a stand or forest at any one point in time

• DFC Report puts forth management recommendations based on wildlife needs, while recognizing the need for commercially viable, sustainable forestry practices.

• DFC Report puts forth recommendations not guidelines

• DFC Report is intended to be a forum to increase communication among biologists and foresters.
Lower Mississippi Valley Joint Venture

www.lmvjv.org