Comprehensive Statewide Forest Inventory Analysis Study-2014 Update

Jim Karels, Director
Florida Forest Service

Florida Forestry Association
Annual Meeting and Trade Show
August 25-27, 2015

Output or Value Added Impacts, $Bn

Employment

- Output Impacts
- Value Added Impacts
- Employment Impacts
## MOVEMENT OF TIMBER ACROSS FLORIDA STATE LINES IN 2013

<table>
<thead>
<tr>
<th></th>
<th>Pine Pulpwood</th>
<th>Pine Sawtimber</th>
<th>Hardwood &amp; Cypress Pulpwood</th>
<th>Hardwood &amp; Cypress Sawtimber</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Florida Production</strong></td>
<td>9,957,279</td>
<td>4,662,802</td>
<td>1,069,942</td>
<td>228,263</td>
<td>15,918,286</td>
</tr>
<tr>
<td><strong>Florida Retained</strong></td>
<td>8,788,557</td>
<td>4,156,893</td>
<td>745,315</td>
<td>199,420</td>
<td>13,890,185</td>
</tr>
<tr>
<td><strong>Imports</strong></td>
<td>2,618,401</td>
<td>1,011,842</td>
<td>10,251</td>
<td>8,665</td>
<td>3,649,159</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td>1,168,722</td>
<td>505,908</td>
<td>324,627</td>
<td>28,843</td>
<td>2,028,100</td>
</tr>
<tr>
<td><strong>Net Exports</strong></td>
<td>(1,449,679)</td>
<td>(505,934)</td>
<td>314,376</td>
<td>20,178</td>
<td>(1,621,059)</td>
</tr>
<tr>
<td><strong>Florida Consumption</strong></td>
<td>11,406,958</td>
<td>5,168,735</td>
<td>755,566</td>
<td>208,085</td>
<td>17,539,344</td>
</tr>
</tbody>
</table>
How did this project get initiated?

The Comprehensive Statewide Forest Inventory Analysis and Study (CSFIAS) was mandated by the Florida legislature in 2012 (House Bill 7117).

The Florida Department of Agriculture and Consumer Services (FDACS) entered into contract with Photo Science company, which partnered with F4 Tech and BioResource Management to conduct the project.
What is the purpose of this project?

This project augments the U.S. Forest Service’s Forest Inventory and Analysis (FIA) program.

The objectives of the project were to assess timber biomass resources. The project determined current timber volumes, growth, and utilization levels, which provided an assessment of forest sustainability by comparing timber drain to timber net growth.
What changes were made for the 2014 CSFIAS project update?

In 2013, the first iteration of the project was completed and presented to the Florida Forestry Association Annual Meeting.

In 2013 and 2014, the Florida Forest Service and Photo Science Company held two meetings with industry stakeholders regarding future steps in the project.
Improvements to the 2014 CSFIAS project update

The contractor developed non-disclosure agreements and surveyed all major wood-using primary mills in Florida for quantity of roundwood and chipped timber purchased for processing in 2013.

Private timberland companies also provided an improved landcover training/verification dataset, which was used for landcover map update in 2014 study.
Improvements to the 2014 CSFIAS project update

To improve the accuracy of CSFIAS results, FIA plot information was used to label appropriate polygons on the landcover map rather than the overlay method previously used.

Project results are now presented at the FIA Unit level, in addition to county level.
Improvements to the 2014 CSFIAS project update

To better account for reserved timber, which is only partially or not at all available for harvest, a percent reserved timber table was used.

Pine standing timber volume, net growth, and demand data is now presented separate from cypress, which is now included with hardwoods.
Improvements to the 2014 CSFIAS project update

- Improved accounting for timber movement across the state lines in timber demand calculations
- Improved accounting for all working primary wood-using mills in Florida in 2013 using forest products industry contacts to verify
How was this project accomplished?

Remote sensing techniques plus the latest available 2013 FIA data were used for inventory and analytical approaches. The study mapped forest land cover, identified forest land ownership, and analyzed the distribution and timber demand of primary wood-using mills and their woodsheds.

Improvements to the 2014 CSFIAS project update

Remote sensing techniques plus the latest available 2013 FIA data were used for inventory and analytical approaches.

The study mapped forest land cover, identified forest land ownership, and analyzed the distribution and timber demand of primary wood-using mills and their woodsheds.
Land Cover Map with Forest & Other Land Cover Classes

Legend

- FIA Region Boundary
- FL County Boundary

Land Cover Class

- Longleaf
- Loblolly/N. FL Slash Pine
- Longleaf Pine/S. FL Slash Pine
- Sand Pine
- Young Pine
- Hardwood
- Mixed Pine-Hardwood
- Cypress
- Mangroves
- Other Forested Wetlands
- Non-Forested Wetlands
- Row Crops
- Pasture/Grassland
- Forest Seed Production
- Fruit Production Orchards
- Water
- Urban
- Other

Albers Conical Equal Area,
N. Am. 1983 HARN, Units: Meter
Percentage Area of Forest and Non-forest Land Cover Types

- Urban: 16.85%
- Forest Seed Production: 0.00%
- Hardwood: 2.37%
- Fruit Production Orchards: 2.72%
- Young Pine: 2.95%
- Sand Pine: 1.20%
- Longleaf Pine/ Southern FL Slash Pine: 2.05%
- Longleaf: 2.49%
- Lobolly/ Northern FL Slash Pine: 14.27%
- Mixed: 3.94%
- Water: 4.17%
- Cypress: 2.77%
- Mangrove: 1.96%
- Other Forested Wetlands: 12.96%
- Non-forested Wetlands: 12.01%
- Other: 0.42%
Percentage Area of Forestland Cover Types in Florida

- Loblolly/ N. FL Slash Pine: 30.39%
- Other Forested Wetlands: 27.59%
- Longleaf: 5.31%
- Mixed: 8.39%
- Longleaf Pine/ S. FL Slash Pine: 4.36%
- Mangrove: 4.17%
- Cypress: 5.91%
- Young Pine: 6.29%
- Sand Pine: 2.56%
- Hardwood: 5.05%
Hardwood & Cypress Timber Stand Age

- 40+ years: 86.68%
- 35 - 40 years: 1.33%
- 30 - 35 years: 1.69%
- 25 - 30 years: 1.01%
- 20 - 25 years: 2.21%
- 15 - 20 years: 1.69%
- 10 - 15 years: 1.13%
- 5 - 10 years: 1.13%
- 0 - 5 years: 2.57%
Hardwood & Cypress Timber Stand Age
Pine Timber Origin

Legend
- FIA Region Boundary
- FL County Boundary
Pine Forests
- Plantation
- Natural

Albers Conical Equal Area,
N. Am. 1983 HARN, Units: Meter
Primary Forest Ownership Categories

Legend
- FIA Region Boundary
- FL County Boundary
Forest Ownership
- Federal
- State
- Local
- Private

Albers Conical Equal Area, N. Am. 1983 HARN, Units: Meter
### Private Florida Forest Ownerships by FIA Unit

<table>
<thead>
<tr>
<th>Percent of Private Forest Ownership</th>
<th>FIA Unit 1</th>
<th>FIA Unit 2</th>
<th>FIA Unit 3</th>
<th>FIA Unit 4</th>
<th>Total for State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private nonindustrial, non-corporate (individual and family)</td>
<td>1,782,788</td>
<td>1,641,154</td>
<td>570,445</td>
<td>170,761</td>
<td>4,165,148</td>
</tr>
<tr>
<td>Private nonindustrial, corporate REIT</td>
<td>611,258</td>
<td>18,879</td>
<td></td>
<td></td>
<td>630,137</td>
</tr>
<tr>
<td>Private nonindustrial, corporate TIMO</td>
<td>294,567</td>
<td>440,171</td>
<td></td>
<td>12</td>
<td>734,750</td>
</tr>
<tr>
<td>Private nonindustrial, corporate other</td>
<td>1,975,915</td>
<td>1,437,792</td>
<td>988,100</td>
<td>392,205</td>
<td>4,794,012</td>
</tr>
<tr>
<td>Private, forest products industry</td>
<td>39,942</td>
<td>20,880</td>
<td></td>
<td></td>
<td>60,822</td>
</tr>
<tr>
<td>Private, conservation land</td>
<td>3,615</td>
<td>19,358</td>
<td>17,027</td>
<td>12,883</td>
<td>52,883</td>
</tr>
<tr>
<td>Private, other</td>
<td>7,431</td>
<td>1,264</td>
<td></td>
<td></td>
<td>8,695</td>
</tr>
<tr>
<td>Total for State</td>
<td>4,715,516</td>
<td>3,579,498</td>
<td>1,575,584</td>
<td>575,849</td>
<td>10,446,447</td>
</tr>
</tbody>
</table>
Standing Timber – Share of Major Timber Products

<table>
<thead>
<tr>
<th></th>
<th>Standing Timber</th>
<th>Pine Pulpwood</th>
<th>Pine Chip N Saw &amp; Sawtimber</th>
<th>Hardwood &amp; Cypress Pulpwood</th>
<th>Hardwood &amp; Cypress Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Tons</td>
<td>151,299,655</td>
<td>255,974,306</td>
<td>212,284,794</td>
<td>378,496,326</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>15.2%</td>
<td>25.6%</td>
<td>21.3%</td>
<td>37.9%</td>
<td></td>
</tr>
</tbody>
</table>
Primary Wood-using Mills in Florida, 2013

Mill type and species utilized

Pine
- Chip
- Chip-n-saw
- Horse bedding
- Mulch
- Pellet
- Plywood
- Pole
- Pole & Saw
- Post
- Pulp
- Saw
- Saw & Mulch
- Saw & Post
- Saw (in construction)

Hardwood
- Firewood
- Mulch
- Saw
- Veneer

Hardwood and cypress
- Mulch
- Saw

Cypress
- Mulch
- Saw
- Saw & Mulch

Pine and hardwood
- Oriented Strand Board
- Pulp

Pine and cypress
- Mulch

Albers Conical Equal Area, N. Am. 1983 HARN, Units: Meter
## Annual Timber Removals by Product and FIA Unit

<table>
<thead>
<tr>
<th>FIA Unit</th>
<th>Pulpwood</th>
<th>Chip-n-Saw &amp; Sawtimber</th>
<th>Pulpwood</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>69.2%</td>
<td>30.8%</td>
<td>84.8%</td>
<td>15.2%</td>
</tr>
<tr>
<td>2</td>
<td>65.4%</td>
<td>34.6%</td>
<td>77.4%</td>
<td>22.6%</td>
</tr>
<tr>
<td>3</td>
<td>85.0%</td>
<td>15.0%</td>
<td>77.4%</td>
<td>22.6%</td>
</tr>
<tr>
<td>4</td>
<td>94.2%</td>
<td>5.8%</td>
<td>100.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

### Annual Removals (green tons)

<table>
<thead>
<tr>
<th>Green Tons</th>
<th>Pulpwood</th>
<th>Chip-n-Saw &amp; Sawtimber</th>
<th>Pulpwood</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,957,279</td>
<td>4,662,802</td>
<td>1,069,942</td>
<td>228,263</td>
<td></td>
</tr>
<tr>
<td>Percent Total</td>
<td>62.6%</td>
<td>29.3%</td>
<td>6.7%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>
# Annual Florida Timber Net Growth by FIA Unit

<table>
<thead>
<tr>
<th>FIA Unit</th>
<th>Pulpwood</th>
<th>Chip-n-Saw &amp; Sawtimber</th>
<th>Pulpwood</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62.1%</td>
<td>37.9%</td>
<td>37.3%</td>
<td>62.7%</td>
</tr>
<tr>
<td>2</td>
<td>55.2%</td>
<td>44.8%</td>
<td>37.3%</td>
<td>62.7%</td>
</tr>
<tr>
<td>3</td>
<td>41.8%</td>
<td>58.2%</td>
<td>36.9%</td>
<td>63.1%</td>
</tr>
<tr>
<td>4</td>
<td>46.2%</td>
<td>53.8%</td>
<td>46.4%</td>
<td>53.6%</td>
</tr>
</tbody>
</table>

## Net Annual Growth (green tons)

<table>
<thead>
<tr>
<th></th>
<th>Green Tons</th>
<th>Pulpwood</th>
<th>Chip-n-Saw &amp; Sawtimber</th>
<th>Pulpwood</th>
<th>Sawtimber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Annual Growth (green tons)</td>
<td>11,994,090</td>
<td>8,766,000</td>
<td>4,130,489</td>
<td>6,561,954</td>
<td></td>
</tr>
<tr>
<td>Percent Total</td>
<td>38.1%</td>
<td>27.9%</td>
<td>13.1%</td>
<td>20.9%</td>
<td></td>
</tr>
</tbody>
</table>
Forest sustainability index is defined as the ratio of net timber growth to timber removals where a value > 1 indicates that there is more growth than removals and therefore the area is sustainable.

A value < 1 indicates that there is more removals than growth and is not sustainable.
Timber Availability

Timber availability is calculated by subtracting the 2013 timber removals for a timber product from the amount of that product’s 2013 annual net timber growth.

If the number is positive, then there is sufficient product to meet timber removals.

If the number is negative, there is insufficient net timber growth to meet timber removals.
Non-reserved Sustainability and Availability Index for Pine Pulpwood by FIA Unit

Non-reserved sustainability index for pine pulpwood (5.0” to 8.9” DBH) aggregated by FIA Unit.

Non-reserved timber availability for pine pulpwood (5.0” to 8.9” DBH) aggregated by FIA Unit.
Non-reserved sustainability index for pine chip-n-saw and sawtimber (≥ 9.0” DBH) aggregated by FIA Unit

Non-reserved timber availability for pine chip-n-saw and sawtimber (≥ 9.0” DBH) aggregated by FIA Unit
Non-reserved Sustainability and Availability Index for Hardwood & Cypress Pulpwood by FIA Unit.

Non-reserved sustainability index for hardwood & cypress pulpwood (5.0” to 10.9” DBH) aggregated by FIA Unit

Non-reserved timber availability for hardwood & cypress pulpwood (5.0” to 10.9” DBH) aggregated by FIA Unit
Non-reserved Sustainability and Availability Index for Hardwood & Cypress Sawtimber by FIA Unit

Non-reserved sustainability index for hardwood & cypress sawtimber (≥11.0” DBH) aggregated by FIA Unit

Non-reserved timber availability for hardwood & cypress sawtimber (≥11.0” DBH) aggregated by FIA Unit
Overall Conclusions

• Florida’s forests are sustainable overall with a statewide sustainability index of 2.0 across forest types and timber products.

• Even after subtracting the timber resource that is reserved, the overall sustainability is only reduced to 1.9.

• The highest pressure is on pine pulpwood across the Northeast and Northwest Florida regions, these areas will need to be monitored closely to ensure a balance between removals and growth.

• The pine chip-n-saw and sawtimber resource in North Florida appears relatively stable.

• Sustainability indices and timber availability for both hardwood & cypress pulpwood and sawtimber indicate relatively little pressure on the resource.
Thank You

The Florida Forest Service would like to thank all cooperators and the timber industry, and forest products companies who contributed to this project.
Additional Contact Information at the Florida Forest Service

Project Questions
Jarek Nowak, Ph.D.
Forest Utilization Specialist
(850) 681-5883
Jarek.Nowak@FreshFromFlorida.com

GIS Data/ Map Requests
Karen Cummins
GIS Analyst
850-618-5842
Karen.Cummins@FreshFromFlorida.com

Comprehensive Statewide Forest Inventory Analysis Study Webpage:
www.FreshFromFlorida.com/Forest_Inventory