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# Onslow Bight Enhanced Conservation Action Planning

## Presentation to the Onslow Bight Conservation Forum

**Hervey McIver**         **April 29,2010**

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**Defining Your Project**

**Developing Strategies & Measures**

**Implementing Strategies & Measures**

**Using Results to Adapt & Improve**

**Conservation Action Planning**

# "If you had a Dollar to spend on Conservation in your Landscape, Where would You Invest it First?"

- Compare the Ecological Effects of various combinations of conservation strategies or management scenarios.

- Compare the cost of implementing each scenario with the resulting ecological impacts to determine a return on investment.

- Complement land management plans for many public agencies and provide a scientific foundation for NEPA assessments and funding requests.
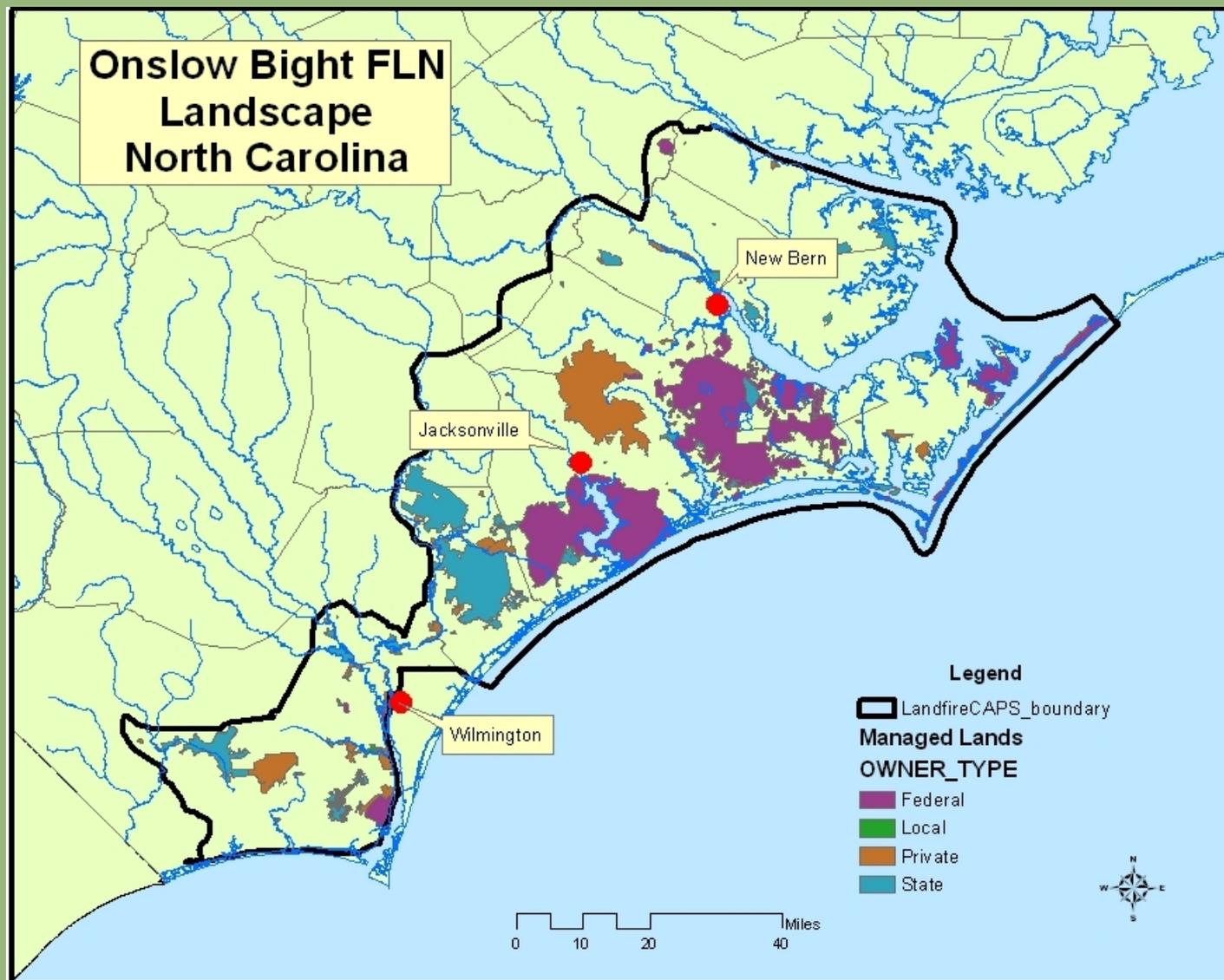
Onslow Bight FLN
Landscape
North Carolina

**Team**

Jennifer Costanza

Tommy Hughes

Hervey McIver

Dan Ryan

Rick Studenmund
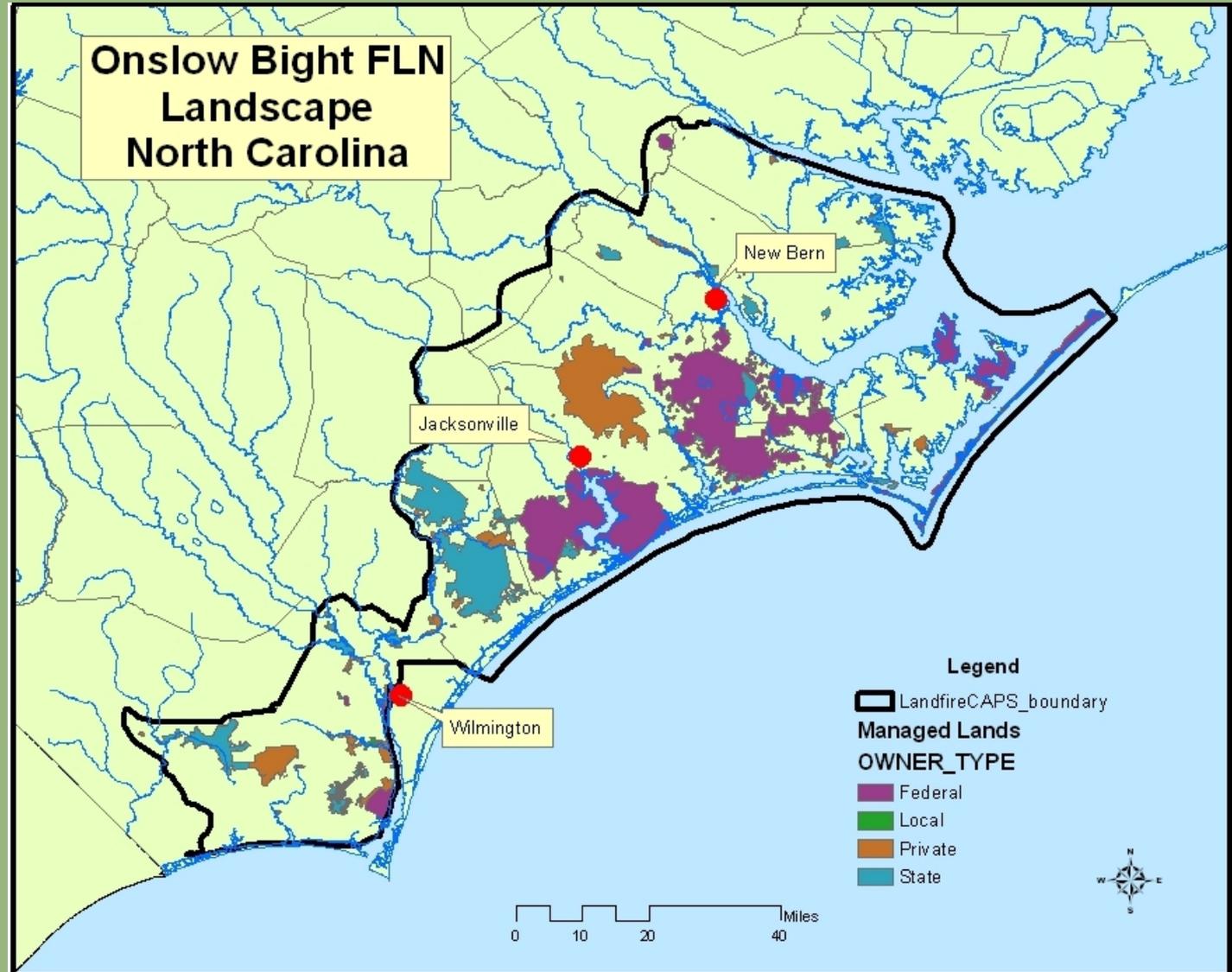


Onslow Bight FLN Landscape North Carolina

2.4 million acres

Peatlands & Pocosin Systems
Savannas & Wet Longleaf Pine
Mesic & Upland Longleaf Pine
Hardwood Systems
Maritime Systems
Riverine Systems
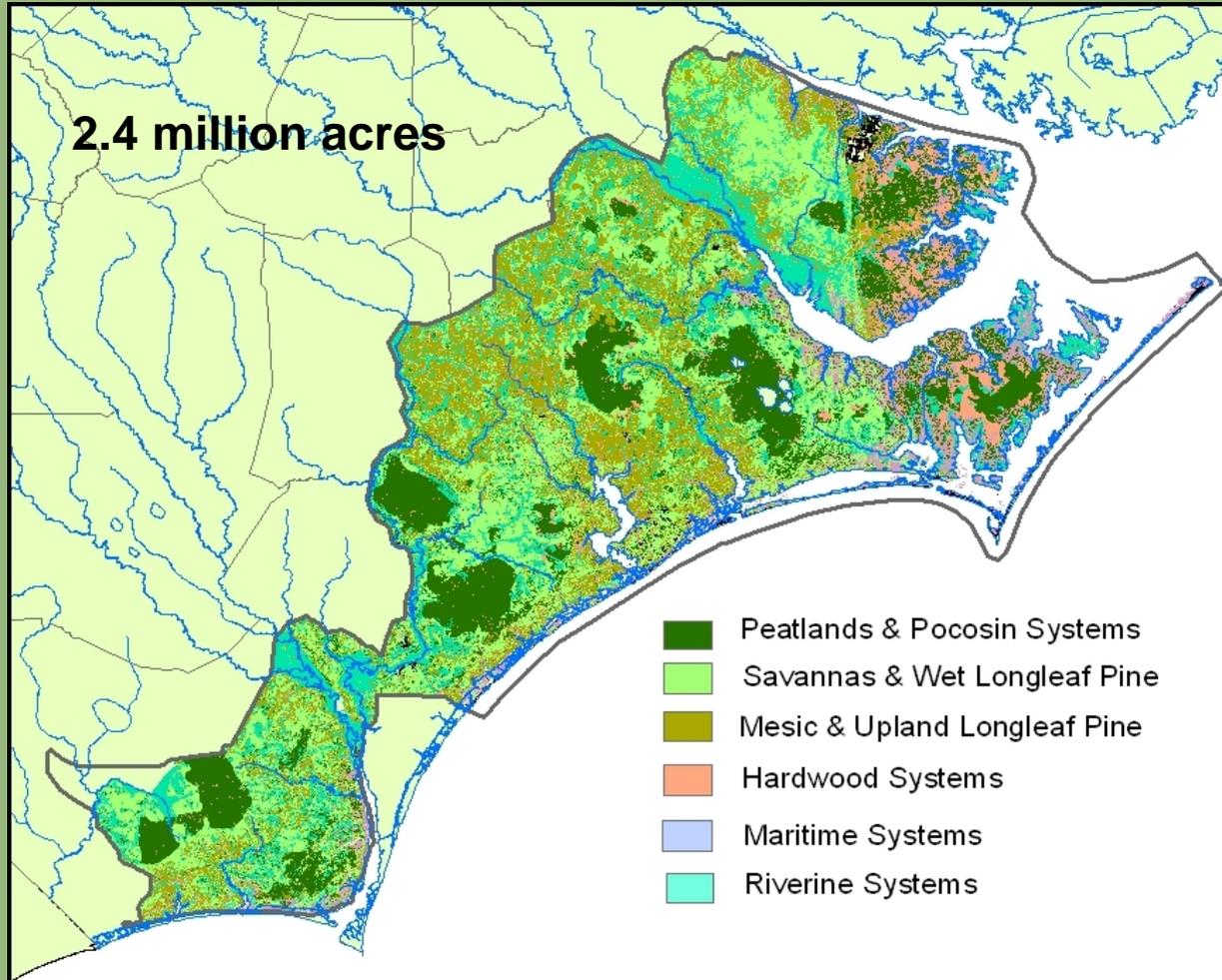
| Ecological System | Acres (rounded to next 100) | Percent |
|---|---|---|
| Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoods | 644,100 | 26.9 |
| Atlantic Coastal Plain Peatland Pocosin and Canebrake | 538,600 | 22.5 |
| Atlantic Coastal Plain Upland Longleaf Pine Woodland | 357,300 | 14.9 |
| Gulf and Atlantic Coastal Plain Small Stream Riparian Systems | 257,500 | 10.8 |
| Gulf and Atlantic Coastal Plain Floodplain Systems | 197,900 | 8.3 |
| Gulf and Atlantic Coastal Plain Tidal Marsh Systems | 161,800 | 6.8 |
| Atlantic Coastal Plain Mesic Hardwood Forest | 67,500 | 2.8 |
| Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest | 59,900 | 2.5 |
| Gulf and Atlantic Coastal Plain Swamp Systems | 54,700 | 2.3 |
| Atlantic Coastal Plain Clay-Based Carolina Bay Wetland | 23,200 | 1.0 |
| Central Atlantic Coastal Plain Maritime Forest | 20,400 | 0.9 |
| Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest | 5,000 | 0.2 |
| Southern Atlantic Coastal Plain Maritime Forest | 3,200 | 0.1 |
| Southern Coastal Plain Mesic Slope Forest | 2,500 | 0.1 |
| Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland | 500 | 0.0 |
| Southern Atlantic Coastal Plain Dune and Maritime Grassland | 400 | 0.0 |
| Atlantic Coastal Plain Streamhead Seepage Swamp-Pocosin-Baygall | 100 | 0.0 |
| Southern Atlantic Coastal Plain Wet Pine Savanna and Flatwoods | 0 | 0.0 |
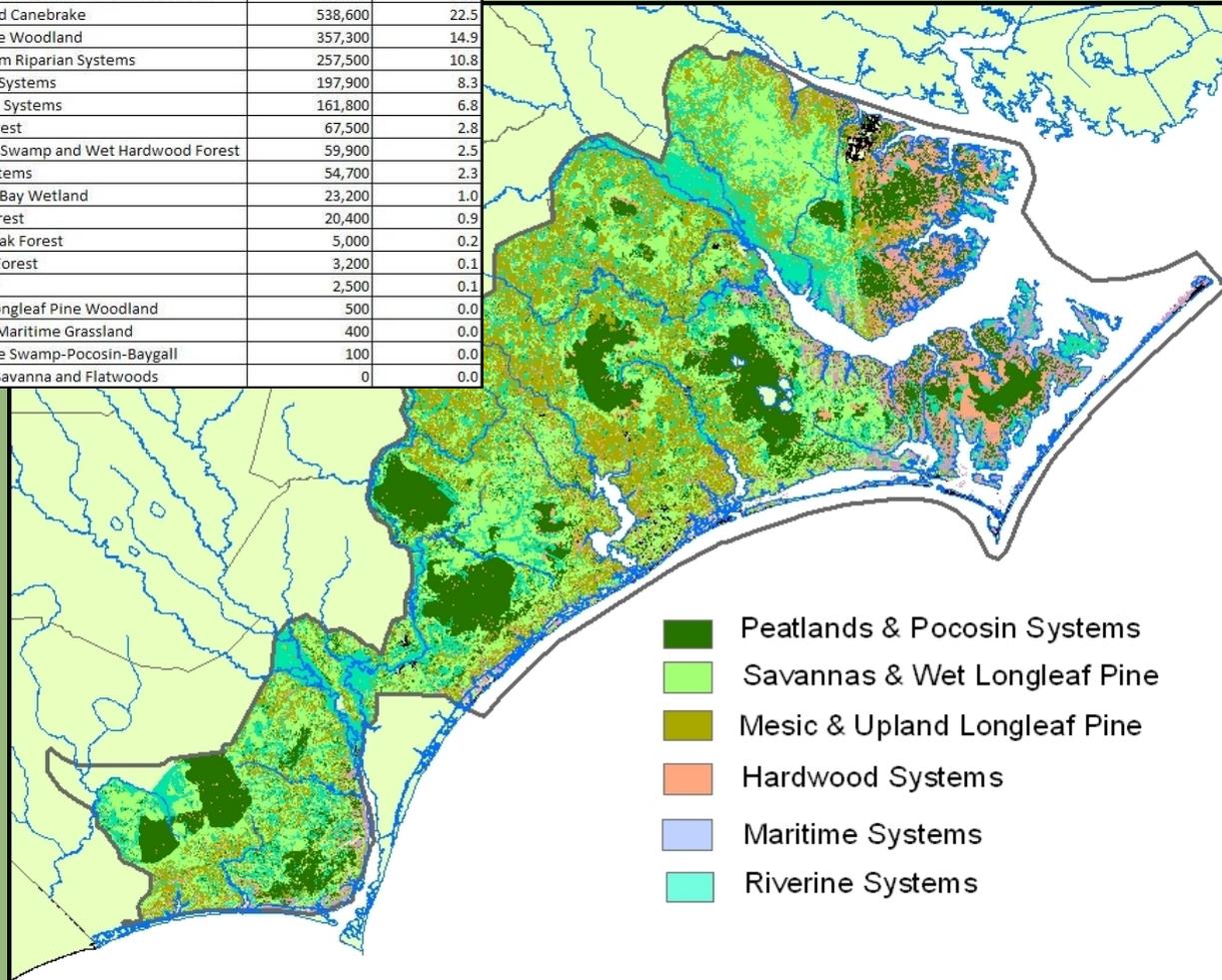
Legend:
- Peatlands & Pocosin Systems
- Savannas & Wet Longleaf Pine
- Mesic & Upland Longleaf Pine
- Hardwood Systems
- Maritime Systems
- Riverine Systems

**1.1 million acres**
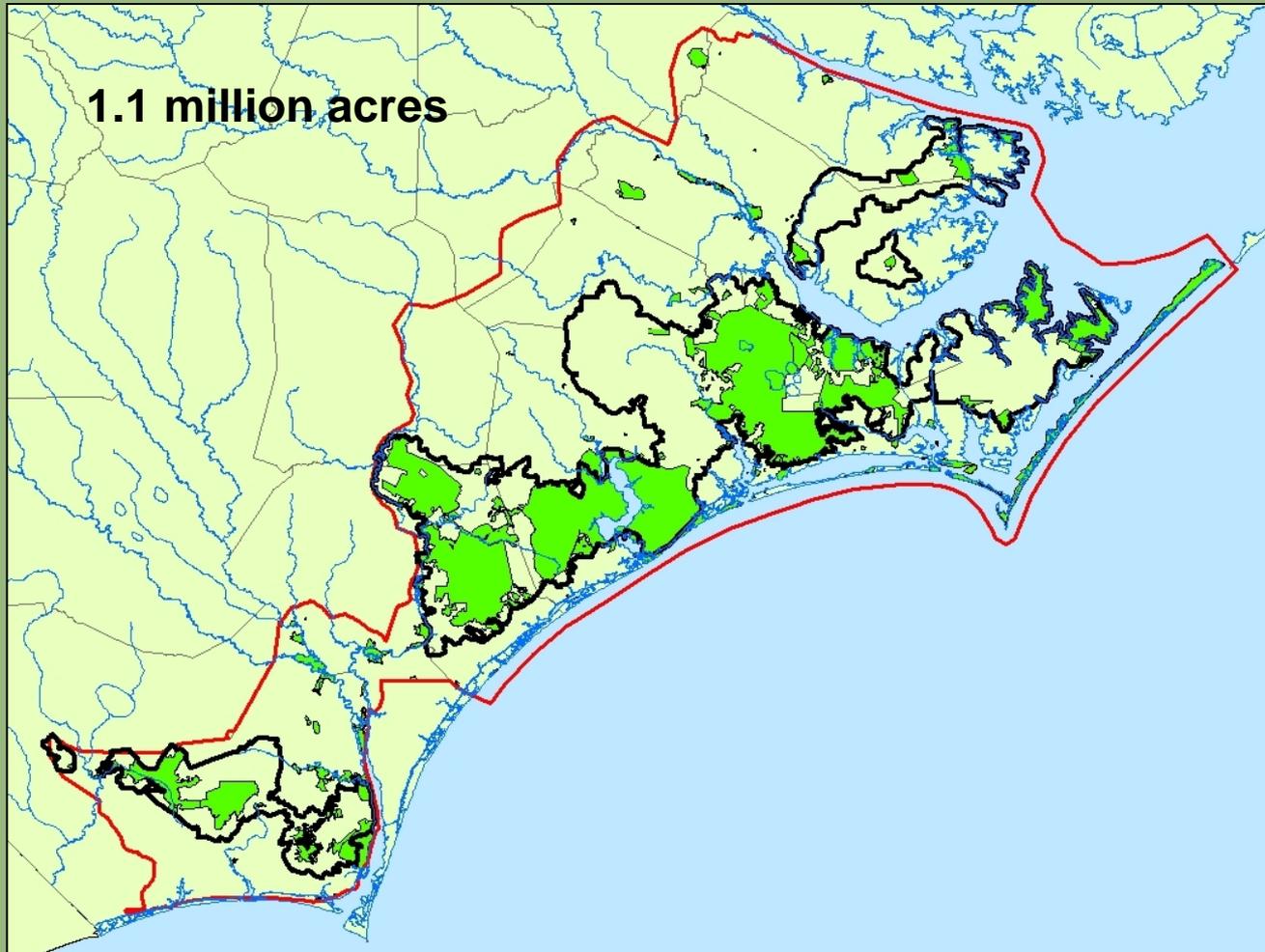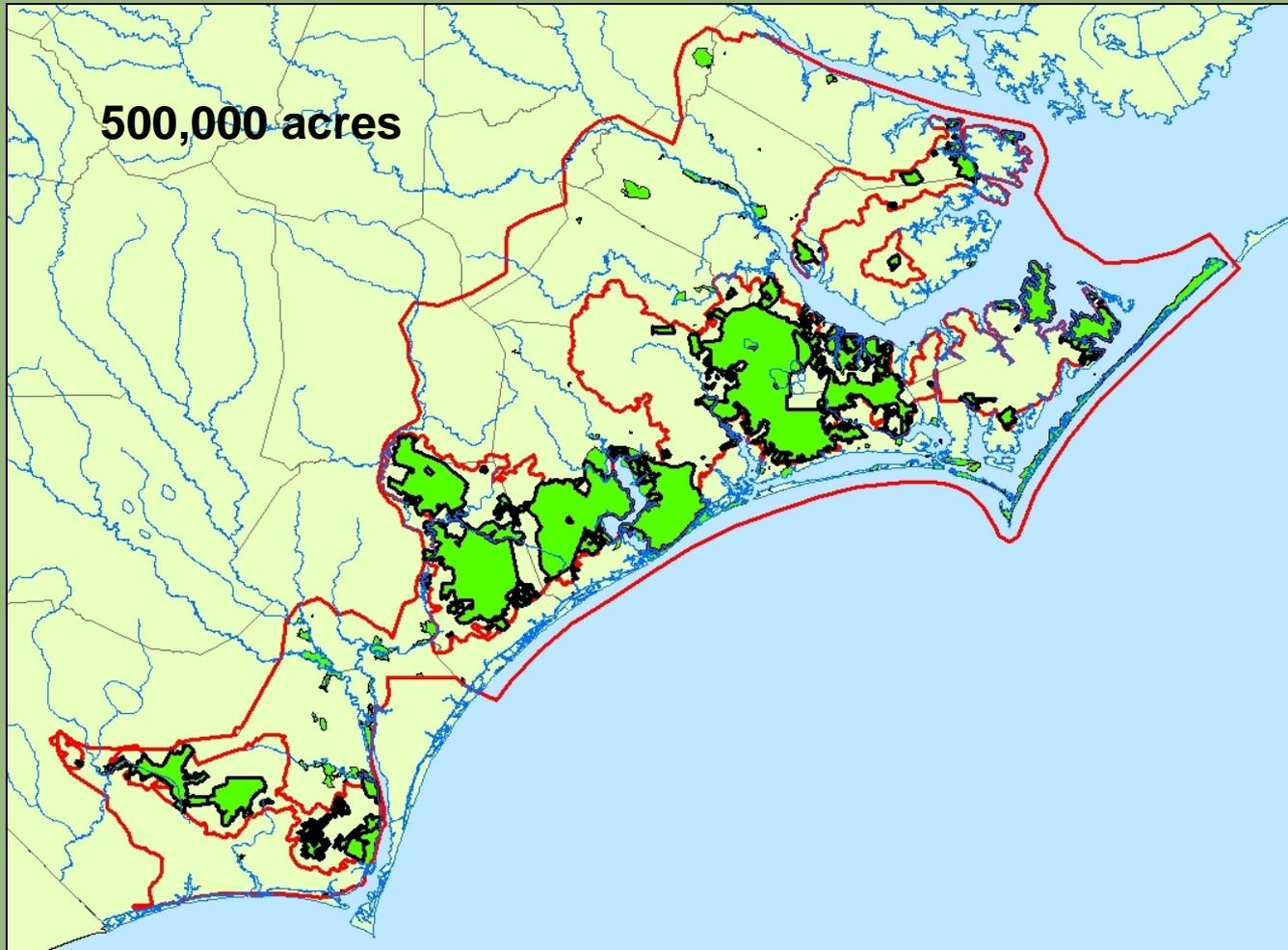
500,000 acres

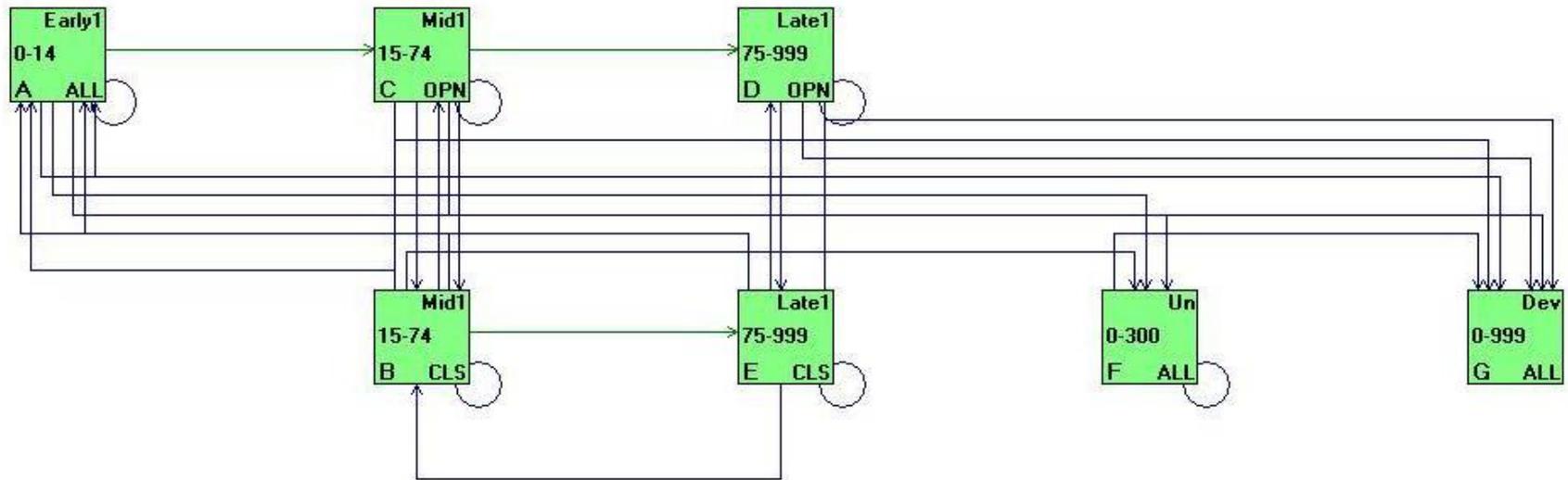| Ecological System | Acres | Percent |
|---|---|---|
| Atlantic Coastal Plain Peatland Pocosin and Canebrake | 199,400 | 42.1% |
| Central Atlantic Coastal Plain Wet Longleaf Pine Savanna and Flatwoo | 112,700 | 22.6% |
| Atlantic Coastal Plain Upland Longleaf Pine Woodland | 38,000 | 7.6% |
| Gulf and Atlantic Coastal Plain Small Stream Riparian Systems | 26,600 | 5.3% |
| Gulf and Atlantic Coastal Plain Floodplain Systems | 25,400 | 5.1% |
| Gulf and Atlantic Coastal Plain Tidal Marsh Systems | 24,200 | 4.8% |
| Gulf and Atlantic Coastal Plain Swamp Systems | 16,700 | 3.3% |
| Atlantic Coastal Plain Mesic Hardwood Forest | 10,600 | 2.1% |
| Central Atlantic Coastal Plain Maritime Forest | 6,100 | 1.2% |
| Central Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood | 5,900 | 1.2% |
| Atlantic Coastal Plain Clay-Based Carolina Bay Wetland | 3,400 | 0.7% |
| Barren-Rock/Sand/Clay | 2,100 | 0.4% |
| Southern Atlantic Coastal Plain Maritime Forest | 900 | 0.2% |
| Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest | 700 | 0.1% |
| Southern Coastal Plain Mesic Slope Forest | 600 | 0.1% |
| Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland | 100 | 0.0% |
| Atlantic Coastal Plain Streamhead Seepage Swamp-Pocosin-Baygall | 0 | 0.0% |
| Southern Atlantic Coastal Plain Dune and Maritime Grassland | 0 | 0.0% |
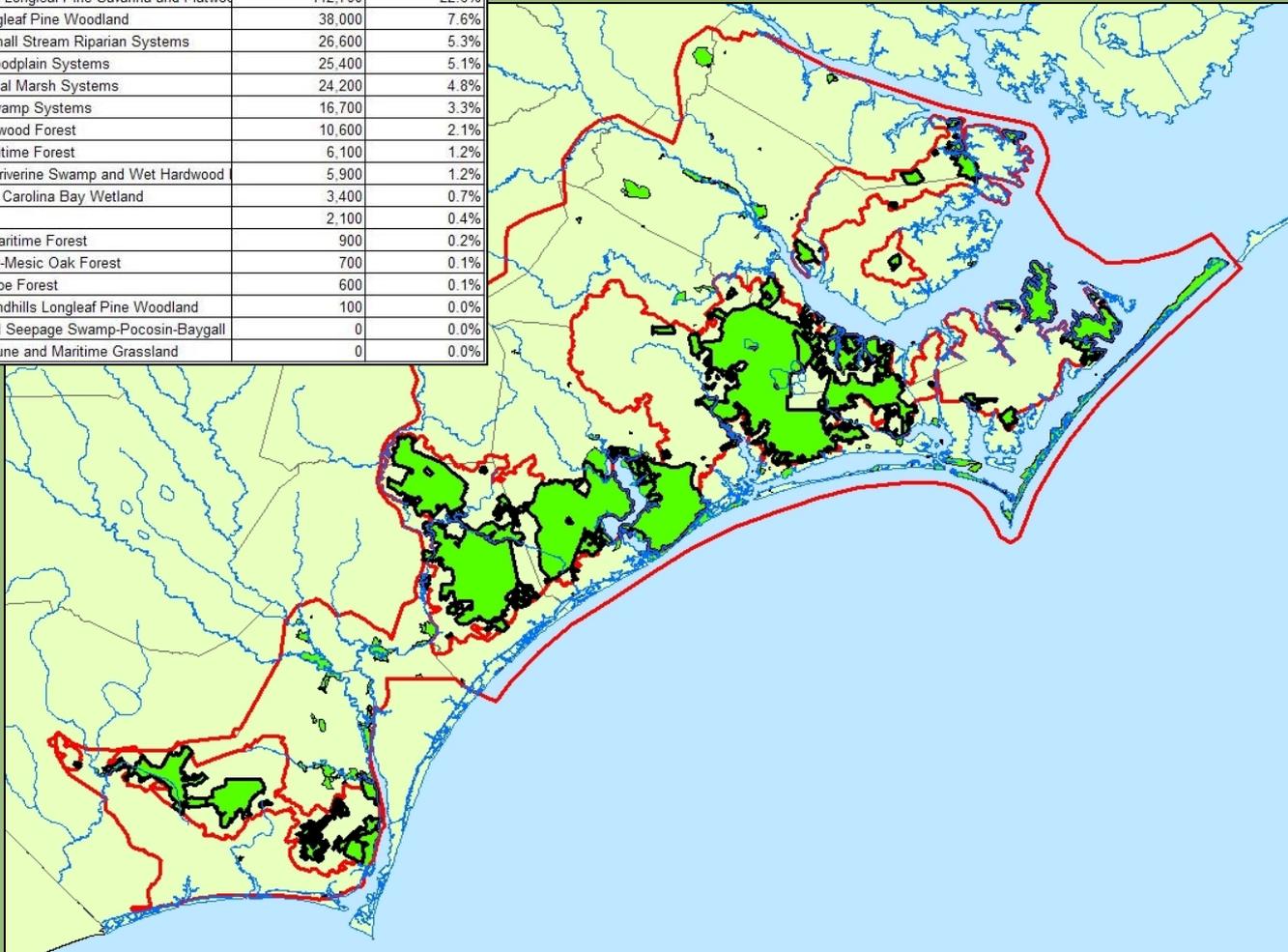
Three VDDT models (ecological systems) used:

· Peatland Pocosin and Canebrake (includes pond pine woodland)

· Wet Longleaf Pine Savanna and Flatwood

· Upland Longleaf Pine Woodland

Certain LANDFIRE data were the basis of the Enhanced CAP process:

· Biophysical Setting (BpS)

· Succession Class (S-class)

5 "Natural" succession classes plus any number of "uncharacteristic" types

Early; Young canopy

Mid-aged canopy; Open underneath

Older canopy; Open underneath

Uncharacteristic types (e.g. pine plantations development)

Mid-aged canopy; Closed underneath

Older canopy; Closed underneath

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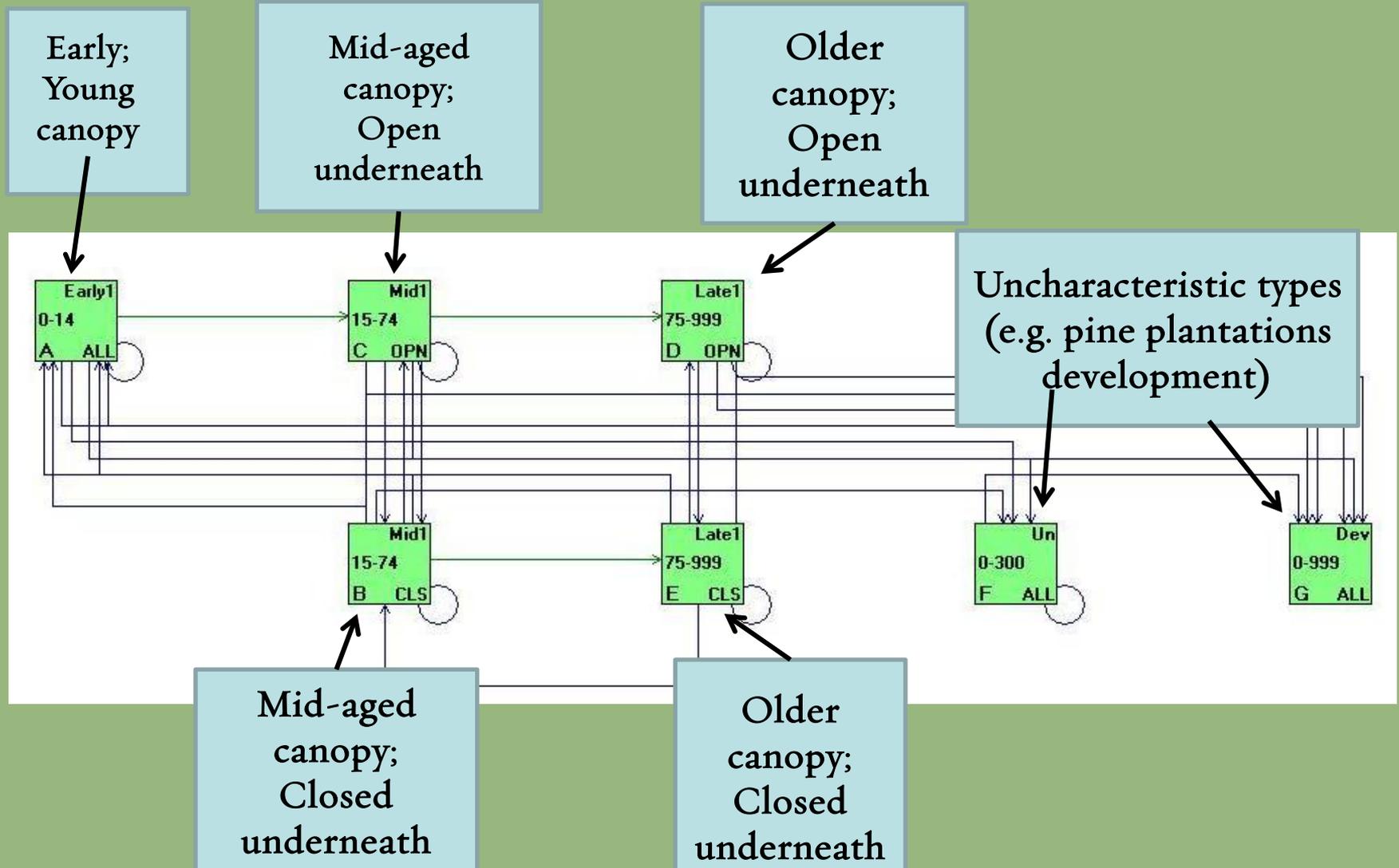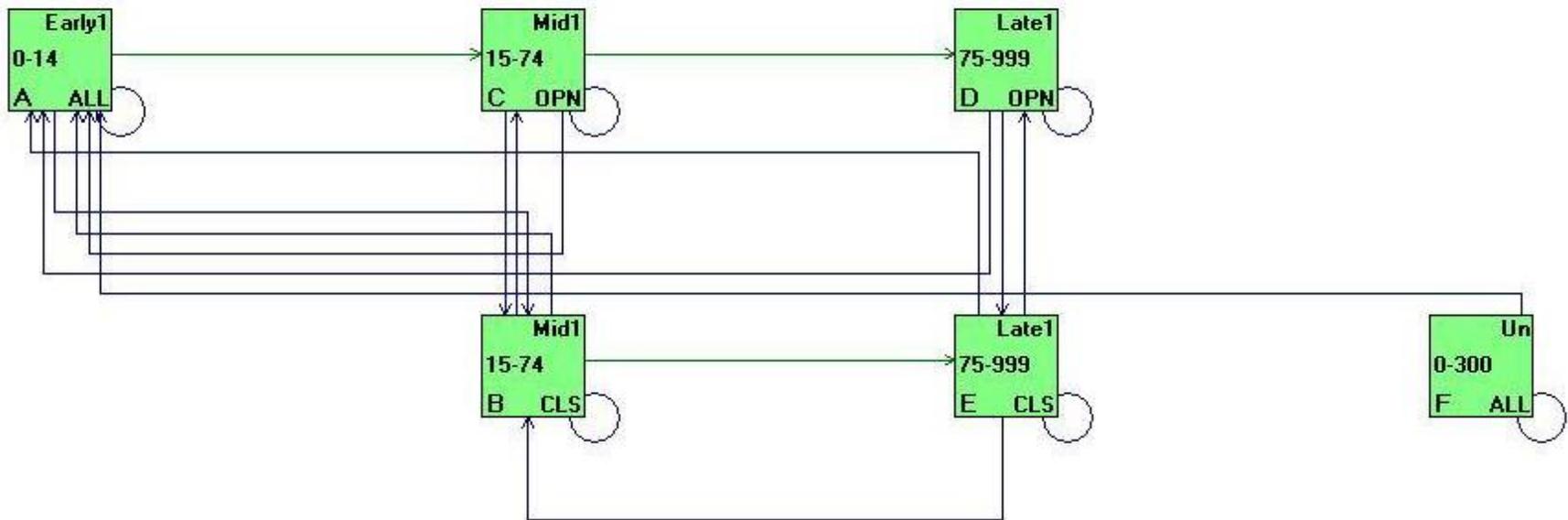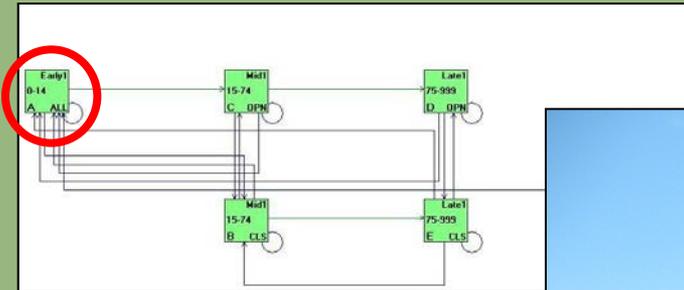


## **Early**
**Young Canopy**
**Age 0-14 yrs**

**Created by canopy destroying events: major fires, storms, disease & infestations, timbering**

**Maintained by fires**
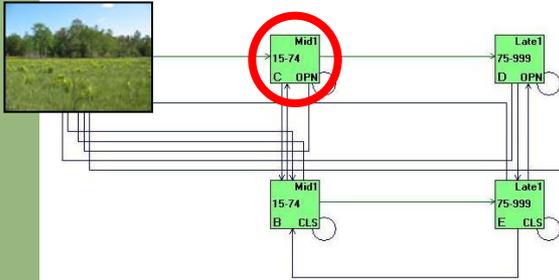
## Mid-Open
**Mid-aged canopy; Open underneath**

**Created by natural growth and fires**

**Maintained by fires**
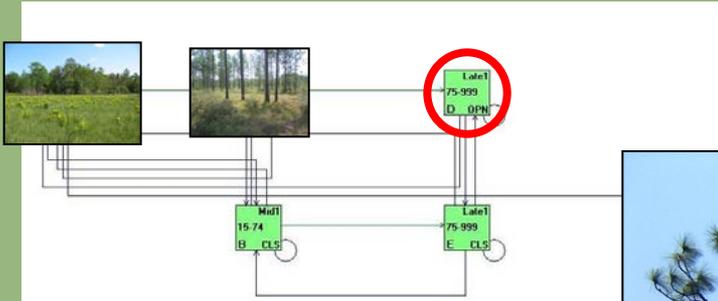
**Late-Open**
**Older canopy;**
**Open**
**underneath**

**Created by natural**
**growth and fires**

**Maintained by fires**

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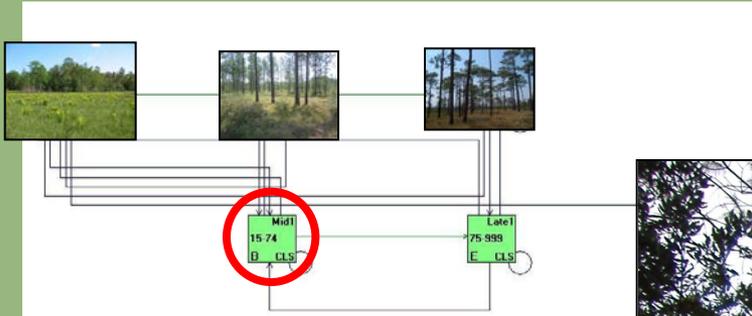


## Mid-Closed
**Mid-aged canopy; Closed underneath**

**Created by natural growth and lack of fire**

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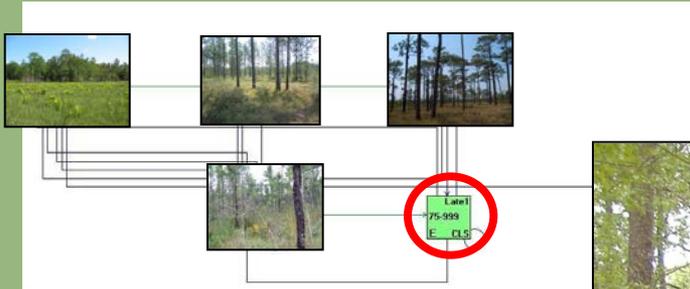


**Late-Closed**
**Older canopy;**
**Closed**
**underneath**

**Created by**
**natural growth**
**and lack of fire**

**Uncharacteristic Class:
Pine plantation**

**Frequent Fire**

**Conversion**

**Lack of Fire**

Black – Deterministic (successional) pathways
Red – Alternative succession (in absence of fire)

# Various Types of Natural and Unnatural Disturbance

- Surface Fire  (less than 25% canopy mortality)
- Mixed Fire   (25-75% canopy mortality)
- Replacement Fire   (greater than 75% canopy mortality)
- Insects/Disease
- Wind/Weather/Stress
- Prescribed Burning
- Restoration (pine plantations)

**Class Properties for Class A: Early1 ALL**

**Deterministic transitions**

| Timing | | | To Class | |
|---|---|---|---|---|
| Start Age | End Age | Box | Cover | Stage |
| 0 | 14 | C | Mid1 | OPN |

A
Early1 - Early-Develop
ALL - AllStructures

**Display Pathways**
- ○ From Class
- ○ To Class

**Probabilistic transitions**

| Transition Type | Min Age | Max Age | Min TSD | Max TSD | Prob | Propn | Prob x Propn | Box | Cover | Stage |
|---|---|---|---|---|---|---|---|---|---|---|
| ReplacementFire | 0 | 14 | 0 | 9999 | 0.0200 | 1.00 | 0.0200 | A | Early1 | ALL |
| AltSuccession | 0 | 14 | 10 | 9999 | 1.0000 | 1.00 | 1.0000 | B | Mid1 | CLS |
| SurfaceFire | 0 | 14 | 0 | 9999 | 0.3000 | 1.00 | 0.3000 | A | Early1 | ALL |
| Conversion | 0 | 14 | 0 | 9999 | 0.0010 | 1.00 | 0.0010 | F | Un | ALL |
| Development | 0 | 14 | 0 | 9999 | 0.0010 | 1.00 | 0.0010 | G | Dev | ALL |
| Rx Fire | 0 | 14 | 0 | 9999 | 0.0100 | 1.00 | 0.0100 | A | Early1 | ALL |
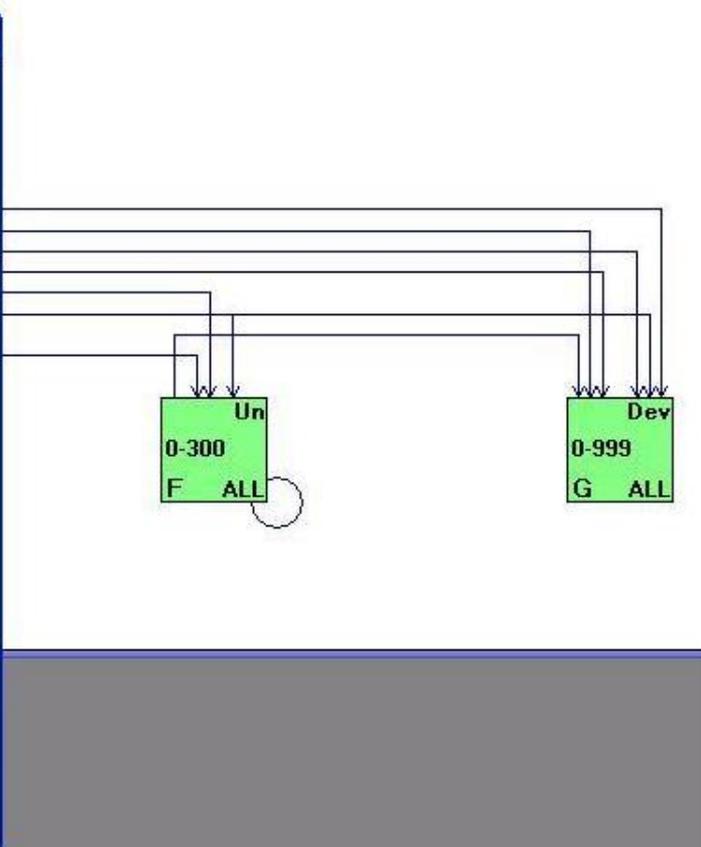
New
Copy
Delete

☑ TSD
☑ Ages
Sort...

OK    Cancel    Apply

Un
0-300
F    ALL

Dev
0-999
G    ALL

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# Assumptions about Transitions

What is the natural chance of an event occurring in a given place in any one year

(the range is spread among the S-classes)

- Surface Fire 30-33% 80% fire suppression
- Mixed Fire 0-5% 90% fire suppression
- Replacement Fire 0-2% 90% fire suppression
- Insects/Disease 0-2%
- Wind/Weather/Stress 0.5 -0.83%

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|  | Current | NRV |
|---|---|---|
| Early | 26% | 15% |
| Mid-open | 16% | 48% |
| Late-open | 0% | 29% |
| Mid-closed | 31% | 5% |
| Late-closed | 0% | 3% |
| Plantations | 27% | 0% |

**Ecological Departure = 64 (good 0 – 100 bad)**

**NRV = Natural Range of Variability (i.e. pre-settlement)**

# Ecological Departure

## Ecological Departure Summary - Onslow Bight Conservation Managed Lands

| Ecological System  (VDDT Model) | % Departure | Acres | % of Area |
|---|---|---|---|
| Central ACP Wet Longleaf Pine Savanna and Flatwoods | 64 | 112,730 | 23.925% |
| ACP Peatland Pocosin and Canebrake | 47 | 199,381 | 42.315% |
| ACP Upland Longleaf Pine Woodland | 53 | 37,985 | 8.062% |
| Gulf and ACP Small Stream Riparian Systems | 63 | 26,555 | 5.636% |
| Gulf and ACP Floodplain Systems | 65 | 25,422 | 5.395% |
| Gulf and ACP Tidal Marsh Systems | 83 | 24,159 | 5.127% |
| ACP Mesic Hardwood Forest | 40 | 10,587 | 2.247% |
| Central ACP Nonriverine Swamp and Wet Hardwood Forest | 92 | 5,922 | 1.257% |
| Gulf and ACP Swamp Systems | 11 | 16,651 | 3.534% |
| ACP Clay-Based Carolina Bay Wetland | 60 | 3,428 | 0.728% |
| Central ACP Maritime Forest | 82 | 6,086 | 1.292% |
| ACP Dry and Dry-Mesic Oak Forest | 49 | 653 | 0.139% |
| Southern ACP Maritime Forest | 52 | 939 | 0.199% |
| Southern Coastal Plain Mesic Slope Forest | 81 | 558 | 0.118% |
| ACP Fall-line Sandhills Longleaf Pine Woodland | | 114 | 0.024% |
| Southern ACP Dune and Maritime Grassland | | 4 | 0.001% |
| ACP Streamhead Seepage Swamp-Pocosin-Baygall | | 5 | 0.001% |
| Totals | | 471,179 | |
| | | | |
| ACP = Atlantic Coastal Plain | | | |
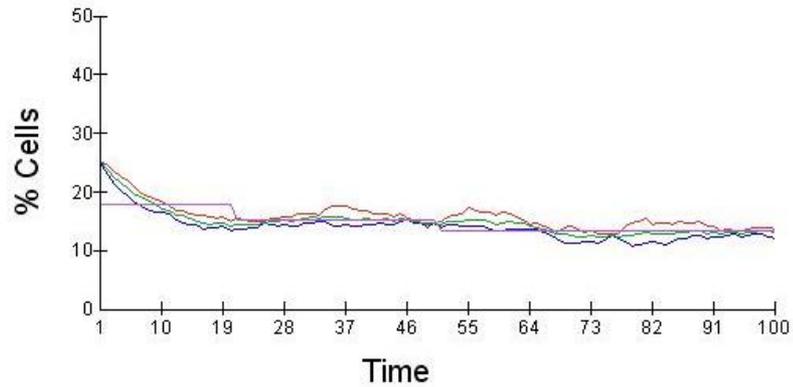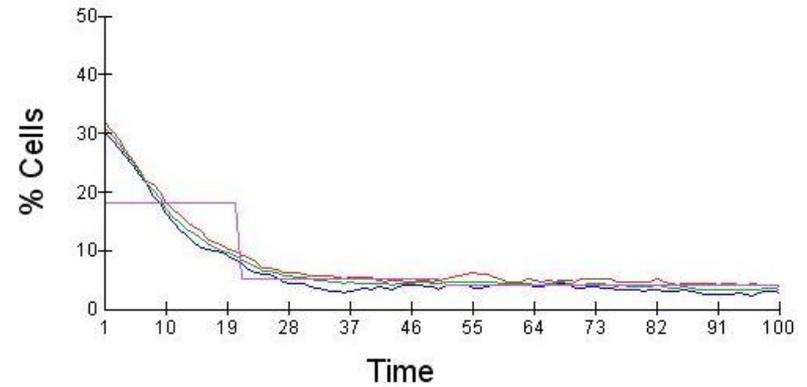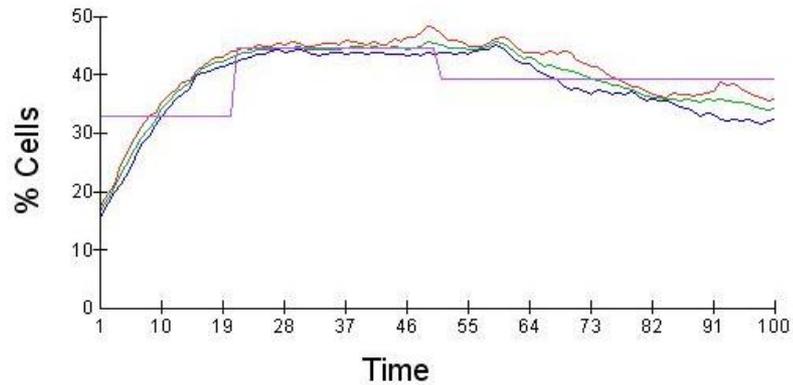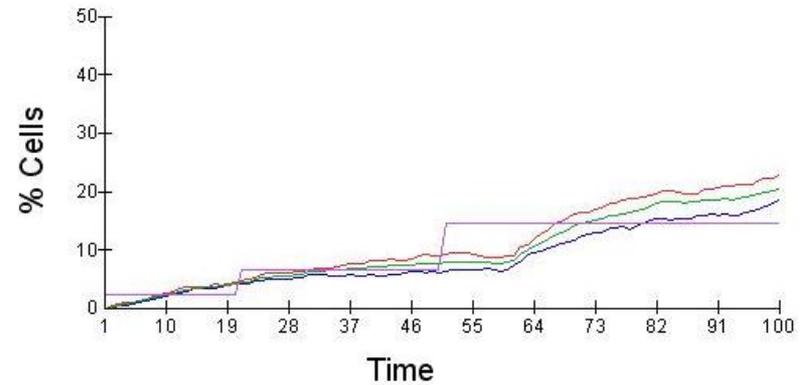
Minimum Management – Wildfire suppression, no Rx fire, no restoration
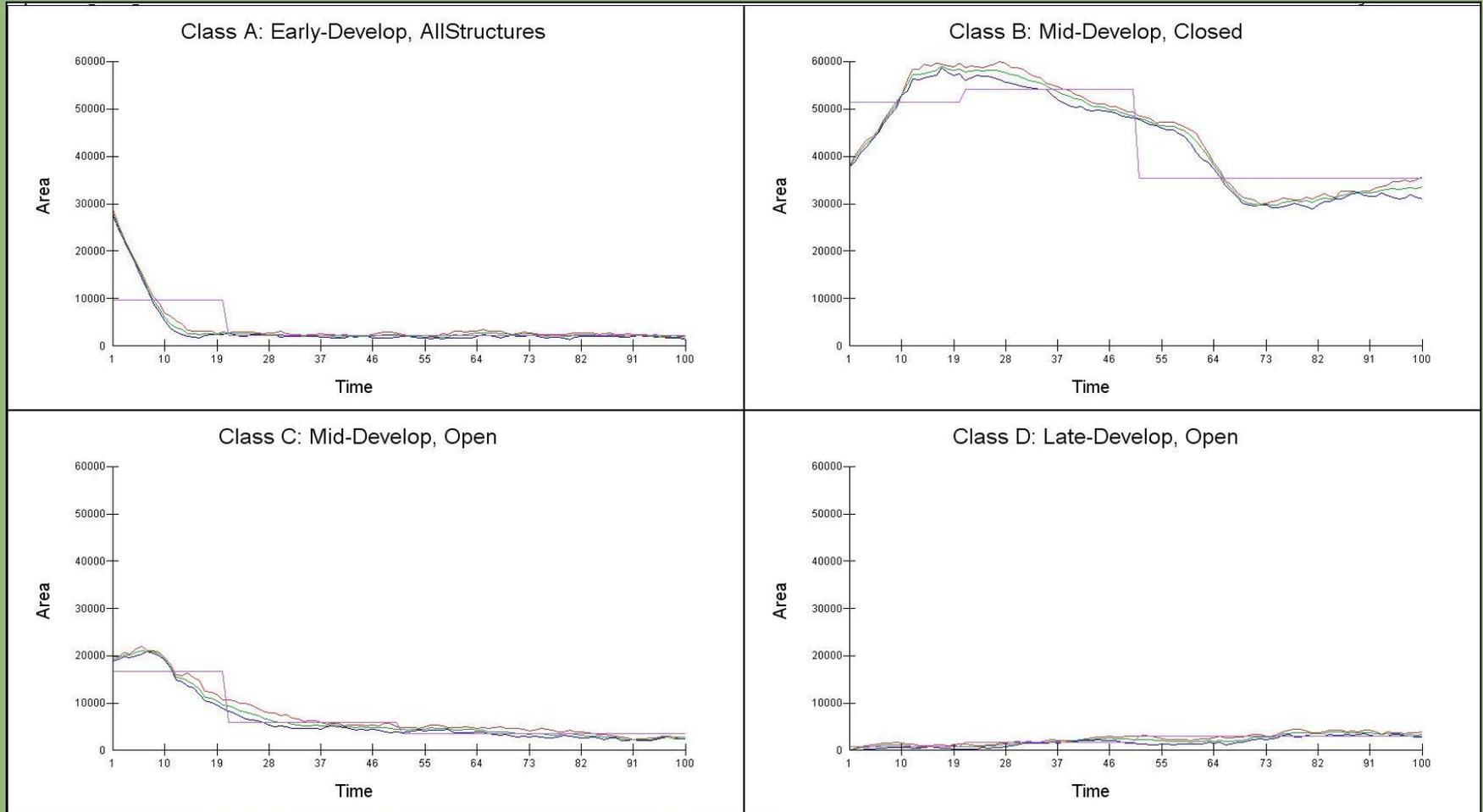
| <u>Strategy</u> | <u>Variables</u> |
|---|---|
| Rx Fire | Number of acres; type of burns (e.g. surface, mixed, replacement) |
| Restoration | Number of acres |
| Fire suppression | Percent of wildfires or escapes suppressed |
| | Time Horizon |

Maximum Management – Less suppression, Rx fire, Restoration

| Vegetation Class (describe) *type x in left box if high-risk* | NRV | Current Condtion | Natural Conditions 100yr | Nat Cond (no Plant) 100yr | MinMgmt 100yr | Status Quo 100 yr | MaxMgmt 100 yr | Status Quo 100 yr w/o suppr |
|---|---|---|---|---|---|---|---|---|
| A - Early | 15% | 26% | 13% | 18% | 1% | 5% | 12% | 13% |
| B - Mid-closed | 5% | 31% | 3% | 4% | 29% | 17% | 1% | 1% |
| C - Mid-Open | 48% | 16% | 34% | 47% | 2% | 31% | 49% | 49% |
| D - Late-Open | 29% | 0% | 20% | 27% | 3% | 26% | 38% | 34% |
| E - Late-Closed | 3% | 0% | 2% | 3% | 39% | 12% | 0% | 3% |
| Plantation | 0% | 27% | 27% | 0% | 27% | 10% | 0% | 0% |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **Ecological Departure** | | 64 | 28 | 4 | 86 | 30 | 10 | 6 |
| **High-Risk Classes** | | - | - | - | - | - | - | - |
| Total Cost | | | $    - | $    - | $    - | $    - | $    - | $    - |
| ROI (vs. Min. Mgmt) | | | | - | - | - | - | - |

| | Enter Notes | | Enter Management Strategies, Number of Acres/Year, Costs & Number of Year |
|---|---|---|---|

| Scenarios (enter name below) | Transitions | Multipliers | | | | |
|---|---|---|---|---|---|---|
| *Natural Conditions 100yr* | | no suppression | | | | |
| *Nat Cond (no Plant) 100yr* | | | | | | |
| *MinMgmt 100yr* | no RX, or rest | suppr (.1-.2) | | | | |
| *Status Quo 100 yr* | RX-12,000 ac. Rx Mixed | suppr (.1-.2) | | | | |
| *MaxMgmt 100 yr* | Rx-10,000; Rx mixed - 10,000; | suppr (.6) 40% | | | | |
| *Status Quo 100 yr w/o sup* | RX-12,000 ac. Rx Mixed | suppr 40% | | | | |
| Cost of Strategy (per acre) | | | | | | |
| Number of Years | | | | | | |

| Vegetation Class (describe) type x in left box if high-risk | NRV | Current Condtion | Natural Conditions 100yr | Nat Cond (no Plant) 100yr | MinMgmt 100yr | Status Quo 100 yr | MaxMgmt 100 yr | Status Quo 100 yr w/o suppr |
|---|---|---|---|---|---|---|---|---|
| A - Early | 15% | 26% | 13% | 18% | 1% | 5% | 12% | 13% |
| B - Mid-closed | 5% | 31% | 3% | 4% | 29% | 17% | 1% | 1% |
| C - Mid-Open | 48% | 16% | 34% | 47% | 2% | 31% | 49% | 49% |
| D - Late-Open | 29% | 0% | 20% | 27% | 3% | 26% | 38% | 34% |
| E - Late-Closed | 3% | 0% | 2% | 3% | 39% | 12% | 0% | 3% |
| Plantation | 0% | 27% | 27% | 0% | 27% | 10% | 0% | 0% |
| | | | | | | | | |
| Ecological Departure | | 64 | 28 | 4 | 86 | 30 | 10 | 6 |
| High-Risk Classes | | - | - | - | - | - | - | - |
| Total Cost | | | $ - | $ - | $ - | $ 8,100,000 | $ 22,650,000 | $ 8,250,000 |
| ROI (vs. Min. Mgmt) | | | | - | - | Negative | 0.1 | 0.3 |

|  | Enter Notes | | Enter Management Strategies, Number of Acres/Year, Costs & Number of Years | | | | | |
|---|---|---|---|---|---|---|---|---|
| Scenarios (enter name below) | Transitions | Multipliers | Restoration of Plantations | RX-Fire (Early & Open classes) | Rx Fire - Mixed (Closed classes) | | | |
| Natural Conditions 100yr | | no suppression | | | | | | |
| Nat Cond (no Plant) 100yr | | | | | | | | |
| MinMgmt 100yr | no RX, or rest | suppr (.1-.2) | | | | | | |
| Status Quo 100 yr | RX-12,000 ac. Rx Mixed | suppr (.1-.2) | 200 | 12000 | 1000 | | | |
| MaxMgmt 100 yr | Rx-10,000; Rx mixed - 10,000; | suppr (.6) 40% | 1500 | 10000 | 10000 | | | |
| Status Quo 100 yr w/o sup | RX-12,000 ac. Rx Mixed | suppr 40% | 200 | 12000 | 1000 | | | |
| Cost of Strategy (per acre) | | | $ 350 | $ 25 | $ 35 | | | |
| Number of Years | | | 20 | 20 | 20 | | | |

# Very similar to Savanna Model with closely similar assumptions

|   |              | Current | NRV |
|---|--------------|---------|-----|
| A | Early, open  | 2%      | 13% |
| B | Mid, closed  | 21%     | 5%  |
| C | Mid, open    | 43%     | 40% |
| D | Late, open   | 0%      | 40% |
| E | Late, closed | 0%      | 2%  |
| F | Plantations  | 34%     | 0%  |

Ecological Departure = 53    (good  0 – 100   bad)

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| Strategy Worksheet | Upland Longleaf | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Enter percentages from "Final Conditions" as a whole number | | | | | | |
| Vegetation Class (describe) *type x in left box if high-risk* | NRV | Current Condtion | Minimum Mgmt - 20 yrs | Minimum Mgmt - 50 yrs | Minimum Mgmt - 100 yrs | Max Mgmt 20 yrs - RxFire | Max Mgmt 50 yrs - RxFire | Max Mgmt 100 yrs - RxFire |
| A - Early | 13% | 2% | 1% | 1% | 1% | 9% | 8% | 8% |
| B | 5% | 21% | 45% | 41% | 14% | 35% | 24% | 21% |
| C | 41% | 43% | 9% | 5% | 3% | 47% | 56% | 46% |
| D | 36% | 0% | 4% | 1% | 1% | 7% | 10% | 21% |
| E | 6% | 0% | 8% | 18% | 47% | 1% | 2% | 3% |
| Plantation | 0% | 34% | 34% | 34% | 34% | 0% | 0% | 0% |
| Development | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | | | | | | |
| Ecological Departure | | 52 | 75 | 82 | 84 | 37 | 34 | 22 |
| High-Risk Classes | | - | - | - | - | - | - | - |
| Total Cost | | | $ - | $ - | $ - | $ 8,625,000 | $ 8,625,000 | $ 8,625,000 |
| ROI (vs. Min. Mgmt) | | | | - | - | 0.4 | 0.5 | 0.6 |
| High-Value Class (D) | | | 4% | 1% | 1% | 7% | 10% | 21% |

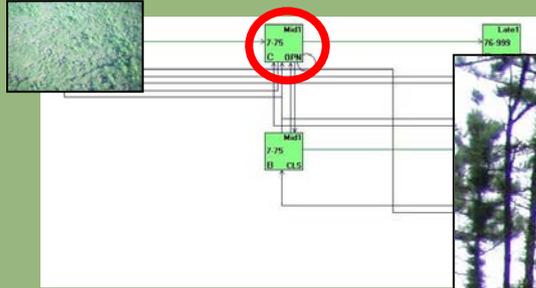| Scenarios (enter name below) | Transitions | Multipliers | High Intensity Restoration | Rx Fire | | | | |
|---|---|---|---|---|---|---|---|---|
| | Enter Notes | | Enter Management Strategies, Number of Acres/Year, Costs & Number of Years | | | | | |
| Minimum Mgmt - 20 yrs | Turn off Rx Fire and restoration | 90% mixed and repl. Suppr.; 80% | | | | | | |
| Minimum Mgmt - 50 yrs | Turn off Rx Fire and restoration | 90% mixed and repl. Suppr.; 80% | | | | | | |
| Minimum Mgmt - 100 yrs | Turn off Rx Fire and restoration | 90% mixed and repl. Suppr.; 80% | | | | | | |
| Max Mgmt 20 yrs - RxFire | 650 restored; 10000 in each Rx | 40% suppression - all fire types | 650 | 5000 | | | | |
| Max Mgmt 50 yrs - RxFire | 650 restored; 10000 in each Rx | 40% suppression - all fire types | 650 | 5000 | | | | |
| Max Mgmt 100 yrs - RxFire | 650 restored; 10000 in each Rx | 40% suppression - all fire types | 650 | 5000 | | | | |
| Cost of Strategy (per acre) | | | $ 400 | $ 35 | | | | |
| Number of Years | | | 20 | 20 | | | | |

## Openings
**Created by peat (Severe) burns or hydrology**

**~10% are hydrologically maintained in a semi-permanent condition (e.g. the "Soups" in the Green Swamp)**

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**Mid-Short**
**Created & Maintained by Fire**

**Canopy can be very sparse to nearly closed; Tree age is main factor - <75 years old**

**Mid-Short**
**(alternative)**

**Canebrake**

**Natural
(Ombrotrophic)
Low Pocosin
would persist in
a Mid or Late
Short class**

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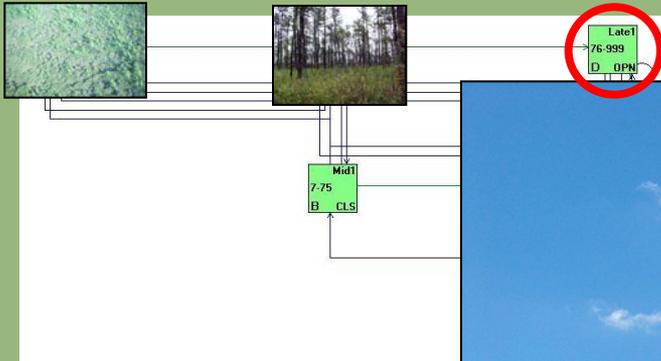


**Late-Short**

**Created & Maintained by fire**

**Some trees >75 years old**
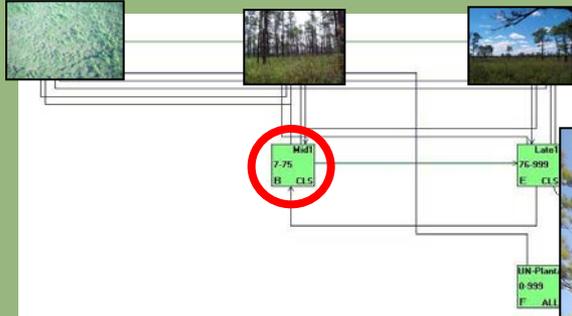
**Mid-High**

**Results from
Fire Exclusion**

**Trees <75 years
Thick, tall shrubs**
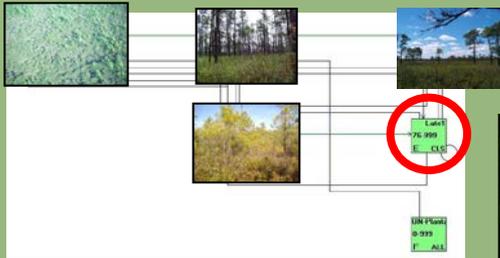
**Late-High**

**Results from Fire Exclusion & Tree growth**

**Trees >75 years**

**Fire**

**Fire**

**Fire Exclusion**
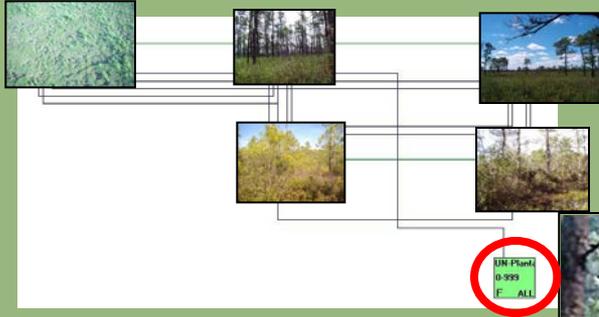
**Pine Plantations**
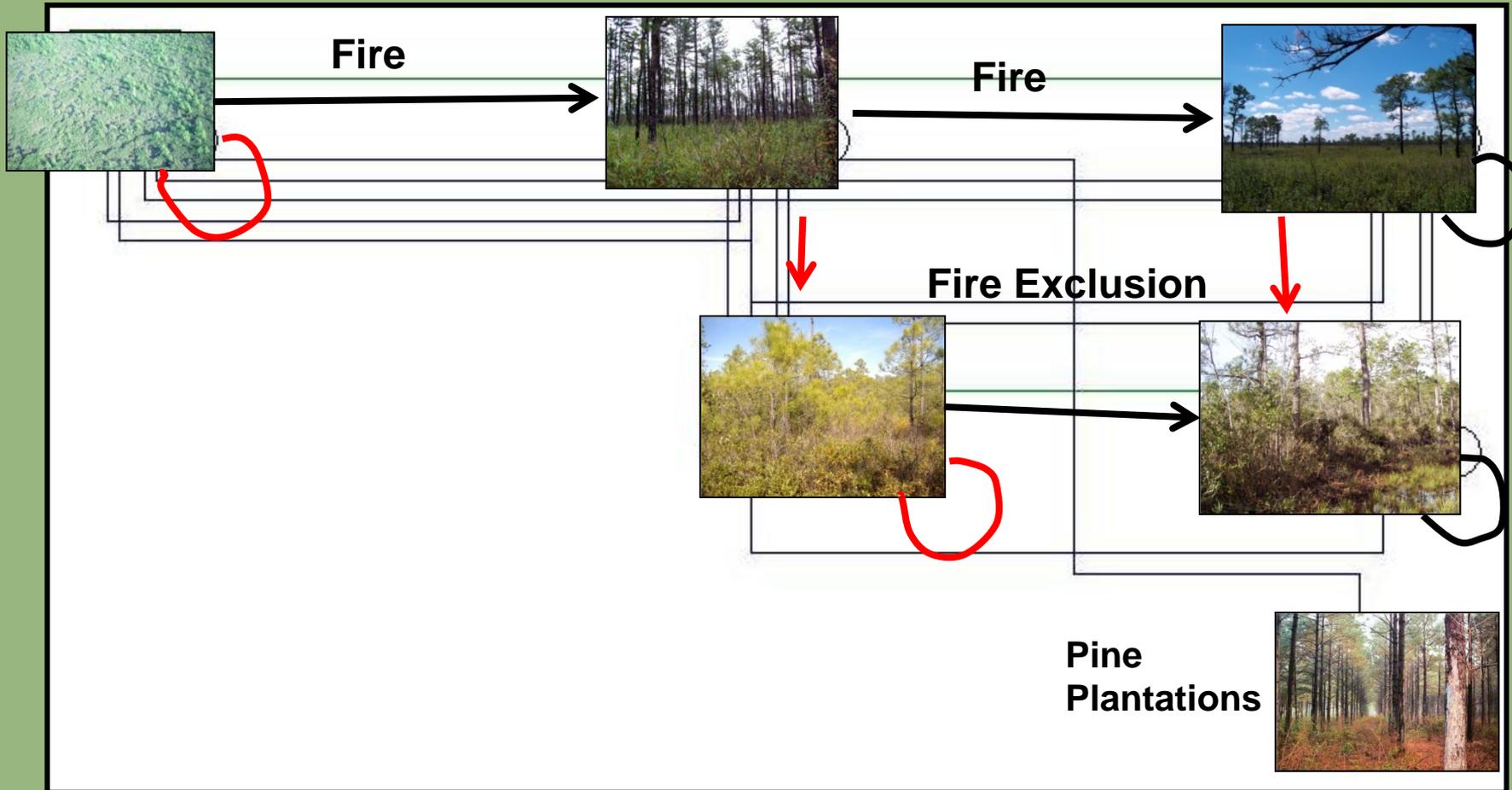
Assumptions about Transitions

What is the natural chance of an event occurring in a given place in any one year   (the range is spread among the S-classes)

- Surface Fire                 5-15%
- Mixed Fire                   4-10%
- Replacement Fire        3-5%
- Severe Fire                   0.5-0.8%
- Wind/Weather/Stress    0.3%

95% of all potential acres burned from wildfires and escapes are suppressed

# Pocosin Current Conditions & Goals

|   |              | Current | NRV |
|---|--------------|---------|-----|
| A | Early, open  | 0%      | 1%  |
| B | Mid, closed  | 56%     | 15% |
| C | Mid, open    | 18%     | 59% |
| D | Late, open   | 14%     | 19% |
| E | Late, closed | 7%      | 6%  |
| F | Plantations  | 6%      | 0%  |

Ecological Departure = 47    (good  0 – 100  bad)

NRV = Natural Range of Variability  (i.e. pre-settlement)

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## Strategy Worksheet — *Pocosin*

Enter percentages from "Final Conditions" as a whole number

| Vegetation Class (describe) *type x in left box if high-risk* | NRV | Current Condtion | Minimum Mgmt - 20 yrs | Maximum Mgmt - 20 yrs | Streamlined 1 - More Rx | Streamlined 2 - Less Rx | Streamlined 3 - Least Rx | Streamlined 4 - Current Rx |
|---|---|---|---|---|---|---|---|---|
| A - Early | 1% | 0% | 0% | 3% | 2% | 2% | 2% | 2% |
| B | 15% | 56% | 53% | 7% | 23% | 31% | 40% | 26% |
| C | 59% | 18% | 4% | 66% | 47% | 37% | 27% | 43% |
| D | 19% | 14% | 2% | 21% | 16% | 13% | 9% | 14% |
| E | 6% | 7% | 36% | 3% | 11% | 15% | 20% | 13% |
| Plantation | | 6% | 5% | 0% | 2% | 2% | 2% | 2% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ecological Departure | | 47 | 73 | 11 | 15 | 28 | 42 | 21 |
| High-Risk Classes | | - | - | - | - | - | - | - |
| Total Cost | | | $ - | $ 14,384,000 | $ 7,342,000 | $ 3,842,000 | $ 1,042,000 | $ 5,592,000 |
| ROI (vs. Min. Mgmt) | | | | 0.4 | 0.8 | 1.2 | 3.0 | 0.9 |

Enter Notes | Enter Management Strategies, Number of Acres/Year, Costs & Number of Years

| Scenarios (enter name below) | Transitions | Multipliers | Rx Fire - Additional | Restoration - Hydrology (number of plugs) | | | | |
|---|---|---|---|---|---|---|---|---|
| Minimum Mgmt - 20 yrs | Turned off conversion, | 95% suppression (.05 in multipliers | | | | | | |
| Maximum Mgmt - 20 yrs | Area limits: 20000 acres for | 40% suppression of every fire type | 20000 | 120 | | | | |
| Streamlined 1 - More Rx | Area limits: 10000 acres for | 70% suppression (.3 for all | 10000 | 60 | | | | |
| Streamlined 2 - Less Rx | Area limits: 5000 acres for Rx fire; | 70% suppression (.3 for all | 5000 | 60 | | | | |
| Streamlined 3 - Least Rx | Area limits: 1000 acres for Rx fire; | 70% suppression (.3 for all | 1000 | 60 | | | | |
| Streamlined 4 - Current Rx | Area limits: 7500 acres for Rx fire; | 70% suppression (.3 for all | 7500 | 60 | | | | |
| Cost of Strategy (per acre) | | | $ 35 | $ 160 | | | | |
| Number of Years | | | 20 | 20 | | | | |

# Evaluating ROI for all Systems

| BpS Name | # Acres | Preferred Scenario | Minimum Management<br>Ecol.<br>Departure | High Risk<br>% | Preferred Scenario<br>Ecol.<br>Departure | High Risk<br>% | Additional<br>cost | Ecosystem<br>Wide ROI<br>(calculated) |
|---|---|---|---|---|---|---|---|---|
| **ROI Across Ecosystems** | | | | | | Enter Multiplier (1, 10 or 100) | | 10 |
| | | | | Enter Whole Numbers | | | | |
| Wet Longleaf | 112,730 | Streamlined 2 - Surface rx | 81 | | 37 | | $ 1,550,000 | 32.0 |
| Upland Longleaf | 37,985 | Stream 1 - less suppression | 75 | | 43 | | $ 3,000,000 | 4.1 |
| Pocosin | 199,381 | Streamlined 4 - Current Rx | 73 | | 21 | | $ 342,000 | 303.2 |
| | | | | | | | **Total Cost** | |
| Wet Longleaf | 112,730 | Streamlined 2 - Surface rx | 81 | | 37 | | $ 6,000,000 | 8.3 |
| Upland Longleaf | 37,985 | Stream 1 - less suppression | 75 | | 43 | | $ 5,500,000 | 2.2 |
| Pocosin | 199,381 | Streamlined 4 - Current Rx | 73 | | 21 | | $ 5,592,000 | 18.5 |
| | | | | | | | **Additional cost per year** | |
| Wet Longleaf | 112,730 | Streamlined 2 - Surface rx | 81 | | 37 | | $ 77,500 | |
| Upland Longleaf | 37,985 | Stream 1 - less suppression | 75 | | 43 | | $ 150,000 | |
| Pocosin | 199,381 | Streamlined 4 - Current Rx | 73 | | 21 | | $ 17,100 | |
| | | | | | | | **Additional cost per year per acre** | |
| Wet Longleaf | 112,730 | Streamlined 2 - Surface rx | 81 | | 37 | | $ 0.69 | |
| Upland Longleaf | 37,985 | Stream 1 - less suppression | 75 | | 43 | | $ 3.95 | |
| Pocosin | 199,381 | Streamlined 4 - Current Rx | 73 | | 21 | | $ 0.09 | |

Having a "let burn" option available for wildfires and escaped prescribed burns on conservation lands and using it <u>when prudent</u> may provide the most cost effective means to return to presettlement conditions at the landscape scale.   Plan current land management with this in mind.

Increasing the amount of prescribed burning may not yield a great deal of ecological improvement <u>assuming</u> a "let burn" wildfire approach and that we're burning the right acres.

The model does not address seasonality of burns.

Restoration of pine plantations, including the hydrology where impacted, using proceeds from the timber sales is important to minimize ecological departure.

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The models and ROI spreadsheet allow a great deal of flexibility in predicting outcomes from diverse permutations of management strategies

The "biggest bang for the buck" is not always what you have been doing

Expect Surprises

Best suited for large landscapes and non-aquatic systems

Refine & improve your starting data if possible

| System | Acres | Fire freq. | Ave. annual burned |
|--------|-------|------------|--------------------|
| Pocosin | 200,000 | ~10 years | 20,000 acres |
| Savanna | 117,000 | ~3 years | 39,000 acres |
| LLP fltwds | 39,000 | ~3 years | <u>13,000 acres</u> |
| | | | 72,000 acres |

72,000 total acres should be burned each year on partner lands through RX or wildfires.