**Vegetation Description**

Ocala sand pine forests have an overstory of uneven or even-aged sand pine with twisted and leaning trunks growing over an understory of evergreen shrubs. Typical understory species include myrtle oak (Quercus myrtifolia), sand live oak (Q. geminata), Chapman's oak (Q. chapmanii), turkey oak (Q. laevis), rusty lyonia (Lyonia ferruginea), rosemary (Ceratiola ericoides), scrub palmetto (Sabal etonia), and saw palmetto (Serenoa repens). Herbs and grasses are very sparse in mature scrub habitats, but lichens (Cladonia spp.) can form extensive patches on the forest floor.

A general map of sand pine scrub depicts three groupings in Florida: inland peninsula, coastal peninsula, and coastal panhandle scrub (Myers 1990). Sand pine scrub discussed here refers to the variety found in...
peninsular Florida.

**Disturbance Description**

The sand pine scrub is typified by fire regimes II and IV; primarily stand replacement fires from 10 to 45 years but some fires occur at shorter or longer intervals. Because of its sparse ground cover and compacted litter layer, most of the time Ocala sand pine scrub will not burn. Approximately every 10 to 100 years, usually during the spring drought, high winds and extreme conditions result in a high intensity passive crown fire that burns the understory, kills the sand pine overstory and opens the serotinous cones contained in its crowns (although all cones may not be serotinous). Prolonged fire suppression of sand pine scrub may result in xeric hammock formation.

Alternative disturbances - Sand pine trees older than 50 years can experience significant mortality due to root disease/rot. This will result in closed stands of class E converting to open stands of class D. In addition, wind disturbances in the form of hurricanes comprise another non-fire disturbance that can significantly affect succession in this system.

**Adjacency or Identification Concerns**

Sand scrub pine is commonly found adjacent to high pine (open pinelands) areas consisting of a Pinus palustris overstory.

Note: This model applies to inland scrub and not to coastal scrub systems in Florida because succession in coastal scrub is driven more by wind events than by fire.

**Scale Description**

Scrub-like vegetation is thought to have been widespread in the peninsula of Florida in the late Pleistocene (44,000-10,000 years before present). The inland scrub systems of today likely persisted on fossil dunes since the early Pleistocene (Myers 1990). The largest contiguous area of this scrub type that remains is estimated at 250,000 acres.

**Issues/Problems**

One assumption in the model is that older open stands do not typically have sufficient seed to produce enough seedlings for stands to become closed in with a canopy cover of sand pine greater than 40%. Once trees become older than 50 years, significant mortality due to root disease is common. This will result in closed stands of class E converting to open stands of class D. Historical fire size reported here is purely estimation, with need for corroboration with a local expert.

**Model Evolution and Comments**

The original code, SPSC, was modeled by Kenneth Outcalt.

This database needs a better scale description. Also, original references cited from original model did not include first names of authors (initials only).

Possible Reviewers- Eric Menges, Archbold Biological Station, P.O. Box 2057, Lake Placid, FL 33862. Mary E. Carrington, Southwest Florida Research and Education Center, University of Florida, Immokalee, FL 34142-9515 (mecar@gnv.ifas.ufl.edu).

One anonymous reviewer reviewed this model. The reviewer stated that the model appears skewed towards dense stands of sand pines in scrub and does not incorporate the variability observed in scrub in Florida, particularly towards the southern end of the Lake Wales Ridge. Other scrub types, including locations where sand pine is absent (e.g. rosemary balds) or at low densities was not incorporated. Scrub jays, which
are an endemic species in Florida scrub, will not persist in areas with higher than 40% cover by sand pine and they prefer less than 10% cover.

It is acknowledged that there is a high degree of variability in scrub and the issue needs to be addressed. The problem here is primarily due to the scale of the Rapid Assessment. There were no changes made during the editorial review of this model as a result of the feedback. However, future iterations of this model for LANDFIRE will need to capture the variability of this vegetation type.

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**Succession Classes**

Succession classes are the equivalent of “Vegetation Fuel Classes” as defined in the Interagency FRCC Guidebook (www.frcc.gov).

**Class A**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%</td>
<td>Early1 All Structures</td>
</tr>
</tbody>
</table>

**Description**

Post fire, the system is shrub-dominated due to prolific sprouting of shrubby oaks. Oaks may return to prefire cover within two years of fire. Seedlings of sand pine are numerous.

**Indicator Species* and Canopy Position**

- QUMY Middle
- QUGE2 Middle
- SAET Low-Mid
- PICL Lower

**Upper Layer Lifeform**

- **Herbaceous**
- **Shrub**
- **Tree**

**Fuel Model**

5

**Structure Data (for upper layer lifeform)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>30%</td>
</tr>
<tr>
<td>Height</td>
<td>Shrub Medium 1.0-2.9m</td>
</tr>
<tr>
<td>Tree Size Class</td>
<td>Sapling &gt;4.5ft; &lt;5”DBH</td>
</tr>
</tbody>
</table>

**Class B**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>55%</td>
<td>Mid1 Closed</td>
</tr>
</tbody>
</table>

**Description**

Class B contains sapling to pole-sized sand pine with greater than 40% canopy cover. There is significant oak cover in the midstory.

**Indicator Species* and Canopy Position**

- PICL Mid-Upper
- QUMY Middle
- QUGE2 Middle
- SAET Low-Mid

**Upper Layer Lifeform**

- **Herbaceous**
- **Shrub**
- **Tree**

**Fuel Model**

5

**Structure Data (for upper layer lifeform)**

<table>
<thead>
<tr>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>40%</td>
</tr>
<tr>
<td>Height</td>
<td>Tree Regen &lt;5m</td>
</tr>
<tr>
<td>Tree Size Class</td>
<td>Pole 5-9” DBH</td>
</tr>
</tbody>
</table>

*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
**Class C** 8%

Mid1 Open

**Description**

Class C contains sapling to pole sized sand pine with less than 40% canopy cover. Much of the area is dominated by mid and understory oaks.

<table>
<thead>
<tr>
<th>Indicator Species* and Canopy Position</th>
<th>Structure Data (for upper layer lifeform)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PICL Mid-Upper</td>
<td>Min 25% Max 40%</td>
</tr>
<tr>
<td>QUMY Middle</td>
<td></td>
</tr>
<tr>
<td>QUGE2 Mid-Upper</td>
<td></td>
</tr>
<tr>
<td>SAET Lower</td>
<td></td>
</tr>
</tbody>
</table>

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 5

**Disturbances**

Non-Fire Disturbances Modeled

- [✓] Insects/Disease
- [✓] Wind/Weather/Stress
- [✓] Native Grazing
- [✓] Competition
- [✓] Other:
- [✓] Other:

**Fire Regime Group: 4**

I: 0-35 year frequency, low and mixed severity
II: 0-35 year frequency, replacement severity
III: 35-200 year frequency, low and mixed severity
IV: 35-200 year frequency, replacement severity
V: 200+ year frequency, replacement severity

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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.

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**References**


*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.*

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**Fire Intervals (FI):**

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class. All values are estimates and not precise.

### Sources of Fire Regime Data

- **Literature**
- **Local Data**
- **Expert Estimate**

### Historical Fire Size (acres)

- **Avg:** 500
- **Min:** 100
- **Max:** 1000

### Fire Intervals (FI):

<table>
<thead>
<tr>
<th>Severity</th>
<th>Avg FI</th>
<th>Min FI</th>
<th>Max FI</th>
<th>Probability</th>
<th>Percent of All Fires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement</td>
<td>45</td>
<td>10</td>
<td>100</td>
<td>0.02222</td>
<td>90</td>
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<tr>
<td>Mixed</td>
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<td></td>
<td>0.0025</td>
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<td>10</td>
</tr>
<tr>
<td>Surface</td>
<td></td>
<td></td>
<td>0.02473</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Historical Fire Size (acres)

<table>
<thead>
<tr>
<th>Severity</th>
<th>Avg FI</th>
<th>Min FI</th>
<th>Max FI</th>
<th>Probability</th>
<th>Percent of All Fires</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Fires</td>
<td>40</td>
<td></td>
<td>0.02473</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Personal Communication: Janet Hinchee, USDA Forest Service, Ocala National Forest, Umatilla, FL.

*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.