

## Rapid Assessment Reference Condition Model

*The Rapid Assessment is a component of the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004 and 2005. For more information, please visit [www.landfire.gov](http://www.landfire.gov). Please direct questions to [helpdesk@landfire.gov](mailto:helpdesk@landfire.gov).*

### Potential Natural Vegetation Group (PNVG)

**R9SPSC      Sand Pine Scrub**

#### General Information

**Contributors** (additional contributors may be listed under "Model Evolution and Comments")

**Modelers**

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**Reviewers**

**Vegetation Type**

Forested

**General Model Sources**

- Literature
- Local Data
- Expert Estimate

**Rapid Assessment Model Zones**

- California
- Great Basin
- Great Lakes
- Northeast
- Northern Plains
- N-Cent. Rockies
- Pacific Northwest
- South Central
- Southeast
- S. Appalachians
- Southwest

**Dominant Species\***

PICL      QUGE  
 QUMY      SAET  
 QUCH      CEER3  
 QULA      SERE2

**LANDFIRE Mapping Zones**

56  
55

**Geographic Range**

Scrub dominated by the Ocala variety of sand pine (*Pinus clausa* var. *clausa*) is native to the Florida central ridge as well as to a strip of old dunes stretching from St. John's County south to the northern portion of Dade County on the east coast, and from near Cedar Key south to Naples on the west coast. This system is endemic to peninsular Florida, and is largely limited to the Ocala National Forest (where it is referred to as the Big Scrub of Ocala) and the Lake Wales Ridge.

**Biophysical Site Description**

Florida pine scrub is a xerophytic, evergreen plant community found on excessively well-drained, nutrient poor entisols (deep droughty infertile sands of marine and aeolian origin) of the quartzsammitt classification. Elevation ranges from 20-200 feet. The area has hot, humid summers, somewhat dry winters, a long growing season, and abundant precipitation (53 to 60 inches per year). However, because of the low moisture-holding capacity of the soils, drought conditions can exist within 2 weeks of a heavy rainfall. It is possible that heavy fog can ameliorate water stress. Surface temperatures of exposed soils can be extreme.

**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.

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

## 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

**Sources of Scale Data**  Literature  Local Data  Expert Estimate

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).

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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.

### **Succession Classes\*\***

*Succession classes are the equivalent of "Vegetation Fuel Classes" as defined in the Interagency FRCC Guidebook ([www.frcc.gov](http://www.frcc.gov)).*

**Class A 12%**

Early1 All Struct

**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.

**Dominant Species\* and Canopy Position**

QUMY Middle  
 QUGE2 Middle  
 SAET Low-Mid  
 PICL Lower

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

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

	Min	Max
Cover	30 %	60 %
Height	Shrub Medium 1.0-2.9m	Shrub Tall >3.0 m
Tree Size Class	Sapling >4.5ft; <5"DBH	

- Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:  
 Pinus clausa cover min = 2%, max = 20% (estimate), with a minimum and maximum height of <5 m (tree regeneration).

**Fuel Model 5**

**Class B 55%**

Mid1 Closed

**Description**

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

**Dominant Species\* and Canopy Position**

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

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

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

	Min	Max
Cover	40 %	60 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	Pole 5-9" DBH	

- Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

**Fuel Model 5**

**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.

**Dominant Species\* and Canopy Position**

PICL Mid-Upper  
 QUMY Middle  
 QUGE2 Middle  
 SAET Lower

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

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

	Min	Max
Cover	25 %	40 %
Height	Tree Regen <5m	Tree Medium 10-24m
Tree Size Class	Pole 5-9" DBH	

- Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

**Fuel Model 5**

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

**Class D 10%**

Late I Open

**Description**

Class D includes mature sawtimber sized sand pine with less than 40% canopy cover. There are scattered seedling to pole sized sand pine in openings created by mature sand pine mortality. Much of the area is dominated by midstory oaks.

**Dominant Species\* and Canopy Position**

PICL Upper  
 QUMY Mid-Upper  
 QUGE2 Mid-Upper  
 SERE Lower

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 10

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

	Min	Max
Cover	20 %	40 %
Height	Tree Medium 10-24m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"DBH	

- Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

**Class E 15%**

Late I Closed

**Description**

Class E includes mature sawtimber-sized sand pine with greater than 40% canopy cover. There are scattered seedling to pole-sized sand pine in openings created by mature sand pine mortality. There are scattered larger oaks. Lichen species (*Cladonia* spp.) are common in large patches.

**Dominant Species\* and Canopy Position**

PICL Upper  
 QUMY Mid-Upper  
 QUCH Mid-Upper  
 QUGE2 Mid-Upper

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** 10

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

	Min	Max
Cover	40 %	50 %
Height	Tree Medium 10-24m	Tree Tall 25-49m
Tree Size Class	Medium 9-21"DBH	

- Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

**Disturbances**

**Disturbances Modeled**

- Fire
- Insects/Disease
- Wind/Weather/Stress
- Native Grazing
- Competition
- Other:
- Other

**Historical Fire Size (acres)**

Avg: 500  
 Min: 100  
 Max: 1000

**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

**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 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

	Avg FI	Min FI	Max FI	Probability	Percent of All Fires
Replacement	45	10	100	0.02222	90
Mixed	400	60	250	0.0025	10
Surface					
All Fires	40			0.02473	

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