# 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. Please direct questions to helpdesk@landfire.gov.*

## Potential Natural Vegetation Group (PNVG)

**R9EGSG Everglades Sawgrass**

## General Information

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


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**Vegetation Type**

Grassland

**Dominant Species***

CLJA
ELCE
RHTR
PAVI2
RHYN
PANIC

**General Model Sources**

- [x] Literature
- [x] Local Data
- [x] Expert Estimate

**LANDFIRE Mapping Zones**

56

**Rapid AssessmentModel Zones**

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

### Geographic Range

Everglades sawgrass occurs in Southern Florida.

### Biophysical Site Description

This PNVG occurs on shallow to deep peat/organic soil. It occurs on flat sites ranging from 0-2 feet in elevation that have an average hydroperiod of 10 months (range 5-12 months).

### Vegetation Description

Everglades sawgrass is a medium tall to tall (3m) grassland with scattered bayheads of short to medium sized broadleaf evergreen trees and shrubs. Vegetation is dominated by sawgrass (Cladium jamaicense), but composition is largely dependent upon hydroperiod, fire frequency, and soil depth. Species composition may range from nearly monotypic stands of sawgrass to a combination of 25-30 species including: spikerush (Eleocharis cellulosa), water hyssop (Bacopa caroliniana), beak rush (Rhynchospora tracyi), switchgrass (Panicum virgatum), cattail (Typha spp.), maidencane (Panicum hemitomon), and saltmarsh morning-glory (Ipomea sagitatta). Periphyton mats are abundant throughout the sawgrass system. Denser and taller stands of sawgrass typically occur on higher areas with deeper organic soils. Sparse, shorter stands occur in lower topography on shallower soils (Kushlan 1990, Gunderson and Loftus 1993).

Sawgrass may be invaded by native trees and shrubs including willow, wax myrtle, and button bush.

### Disturbance Description

Everglades sawgrass is classified in Fire Regime Group II, stand replacement, with a 2-15 year fire interval. Moderate to high intensity fires occur at 6-15 year intervals, and appear associated with El Nino Southern Oscillation influences (Beckage et al., 2003; Gunderson and Snyder, 1994; Beckage and Platt, 2003). Natural, light ground fires typically occur every 1 to 5 years (Florida Natural Areas Inventory 1990). Most of the acreage burns from April to June during the drier, early lightning season. Less common (1-2/decade) severe fires associated with drought occur primarily from March-May (Gunderson and Snyder, 1994).

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

Anthropogenic fires are dominant in some areas. The natural fire regime is currently altered by urbanization and artificially controlled water levels (Lockwood et al., 2003).

An absence of fire results in the buildup of soil/peat. This buildup also makes severe fires, which can consume the peat soil, more likely. These intense drought fires can lower the surface, changing the area from a sawgrass swale into a wet slough, at least until the peat builds up again (Gunderson, 1994).

### Adjacency or Identification Concerns

Common invasive species include Melaleuca (Melaleuca quinquenerva) and Casuarina (Casuarina spp.).

Everglades sawgrass is often adjacent to Marl Prairie (R9MAPR), Coastal Prairie/Mangrove (R9SFPM), or cypress savannahs (e.g., Big Cypress Preserve).

Much of the area's hydrology is vastly altered by creation of the Water Conservation Areas, and other associated dikes, levies, and canals. Some of the resulting changes may be permanent because the weight of stored water in the WCAs may have compressed the substrate.

### Scale Description

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

Fires can range in size from 1 hectare to 100,000 hectares. Hurricanes can cause huge flooding effects, possibly affecting the entire ecosystem at once.

### Issues/Problems

The flood control and storage systems of this region have vastly altered the Everglades. Anthropogenic fires are dominant in some areas, but the changes in hydrology have also affected the course of natural fires. Hurricanes are not a problem for this system, for it has evolved with such disturbance. However, the actions of water managers in response to hurricanes have threatened to destroy the ecosystem.

### Model Evolution and Comments

The pre-existing FRCC is EGSG. The pre-existing Ecological System description is CES411.286.

The estimates of natural fire frequency and intensity are very uncertain. This also means the estimates of the 'natural' area within each class are uncertain. It is a guess and is open to review. Estimates of canopy closure and height should receive some scrutiny.

Perhaps contact Sonny Bass (sonny_bass@nps.gov, Everglades National Park), Bob Panko (Bob_Panko@nps.gov, ENP Fire Cache), Julie Lockwood (lockwood@aesop.rutgers.edu, Rutgers University), Stuart Pimm (StuartPimm@aol.com, Duke University), or experts at Florida International University.

This PNVG received two reviews. As a result of the reviews several descriptive changes were made to the original model description including:
1. Removing gulf muhly as a dominant species,
2. Adding several species including Rhynchospora traceyi, Bacopa caroliniana, and Panicum virgatum to the vegetation description,
3. Adding the presence of periphyton mats to the vegetation description,
4. Changing the mean fire interval from 1-10 years to 2-15 years,
5. Removing the phrase “moderate to high intensity fires occurring any time of the year” and substituting “ Moderate to high intensity fires occur at 6-15 year intervals, and appear associated with El Nino Southern Oscillation influences (Beckage et al., 2003; Gunderson and Snyder, 1994; Beckage and Platt, 2003).”

## Succession Classes**

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

### *Class A* 93 %

Early1 All Struct

**Description**

Class A is characterized by a range of conditions from early post replacement to sawgrass swale. This class lasts up to 10 years post replacement, and is maintained in Class A by a moderate intensity, typically growing season fire. Species composition and structure includes primarily sawgrass of varying heights and densities. Class A can transition to Class C following a severe ground fire which consumes and lowers the soil level, followed by high water levels.

**Dominant Species* and Canopy Position**

CLJA Upper

**Upper Layer Lifeform**

- ☑ Herbaceous
- ☐ Shrub
- ☐ Tree

**Fuel Model** 3

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

| | Min | Max |
|---|---|---|
| *Cover* | 0 % | 75 % |
| *Height* | Herb Short <0.5m | Herb Tall > 1m |
| *Tree Size Class* | no data | |

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

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### *Class B* 4 %

Mid1 Closed

**Description**

Class B is characterized by a mid-stage sawgrass swale and shrub wetland, and occurs after 10 years following a post replacement event. Encroaching shrubs include willow, wax myrtle, and button bush. Class B can revert to A by repeated growing season moderate to high intensity fires at 1-5 year intervals. Class B can transition Class C (slough) following a severe fire which consumes and lowers the soil level, followed by high water levels.

**Dominant Species* and Canopy Position**

CLJA Middle
MYCE Upper
CEOC2 Upper
SACA5 Upper

**Upper Layer Lifeform**

- ☐ Herbaceous
- ☑ Shrub
- ☐ Tree

**Fuel Model** 3

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

| | Min | Max |
|---|---|---|
| *Cover* | 25 % | 75 % |
| *Height* | Shrub Medium 1.0-2.9m | Tree Short 5-9m |
| *Tree Size Class* | Sapling >4.5ft; <5"DBH | |

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

Sawgrass may still be dominant. It can be up to 3m in height and 50-90% canopy cover.

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### *Class C* 2 %

Late1 Open

**Description**

Class C is characterized by an open water area formed following severe fires that occur during drought conditions and consume the organic soils, followed by high water levels. Sawgrass stems are submerged by the high water levels. Class C can return to Class A after drought condition fires followed by low water levels, if there is water flow. If there is no water flow, then the area typically remains in Class C.

**Dominant Species* and Canopy Position**

CLJA Upper

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

| | Min | Max |
|---|---|---|
| *Cover* | 0 % | 25 % |
| *Height* | Herb Short <0.5m | Herb Tall > 1m |
| *Tree Size Class* | no data | |

**Upper Layer Lifeform**

- [x] Herbaceous
- [ ] Shrub
- [ ] Tree

**Fuel Model** no data

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

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### *Class D* 1 %

Late1 Closed

**Description**

Class D occurs as hydric Hammock, mixed cypress-hardwood swamp (no water flow), or mangrove swamp (tidal flow). Class D is maintained by no fire. Following a severe fire Class D could revert to Class B or Class C, depending upon water levels.

**Dominant Species* and Canopy Position**

TAAS
RHMA

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

| | Min | Max |
|---|---|---|
| *Cover* | 25 % | 75 % |
| *Height* | Tree Regen <5m | Tree Medium 10-24m |
| *Tree Size Class* | Sapling >4.5ft; <5"DBH | |

**Upper Layer Lifeform**

- [ ] Herbaceous
- [ ] Shrub
- [x] Tree

**Fuel Model** no data

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

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### *Class E* 0 %

Late1 All Structu

**Description**

**Dominant Species* and Canopy Position**

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

| | Min | Max |
|---|---|---|
| *Cover* | % | % |
| *Height* | no data | no data |
| *Tree Size Class* | no data | |

**Upper Layer Lifeform**

- [ ] Herbaceous
- [ ] Shrub
- [ ] Tree

**Fuel Model** no data

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

## *Disturbances*

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**Disturbances Modeled**

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

**Historical Fire Size (acres)**

Avg: 1000
Min: 1
Max: 500000

**Sources of Fire Regime Data**

- [x] Literature
- [x] Local Data
- [x] Expert Estimate

**Fire Regime Group:** **2**

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.

| | *Avg FI* | *Min FI* | *Max FI* | *Probability* | *Percent of All Fires* |
|---|---|---|---|---|---|
| *Replacement* | 3 | 2 | 15 | 0.33333 | 96 |
| *Mixed* | | | | | |
| *Surface* | 70 | | | 0.01429 | 4 |
| *All Fires* | 3 | | | 0.34763 | |

## *References*


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