14830

South Florida Everglades Sawgrass Marsh

BpS Model/Description Version: Aug. 2020

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Vegetation Type

Herbaceous Wetland

Map Zones

56

Geographic Range

Everglades sawgrass is endemic to south FL (NatureServe 2006).

Biophysical Site Description

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

NatureServe (2006) notes this marsh system was a dominant type throughout much of the Everglades region of southeastern FL. It consists largely of herbaceous marsh vegetation across a range of soil and hydrologic conditions, but generally falls within conditions outlined by Duever et al. (1986), i.e., hydroperiod of 225-275 days per year, maximum wet-season water level of 40cm and occurrence on peat soils. Sawgrass beds or "glades" may have been the single most extensive component of this system (Hilsenbeck et al. 1979), and large areas may have the appearance of nearly monotypic stands of *Cladium mariscus* ssp. *jamaicense*. However, local variation in composition and stature are also often apparent. For example, two broad aspect types of *Cladium* marsh are often recognized based on density and/or height (Kushlan 1990, Gunderson and Loftus 1993) with denser and taller stands typically occurring on higher topographic positions and deeper organic soils, while sparser, shorter stands occur in lower topography on shallower soils. In addition, other marsh types are also interfingered in the sawgrass matrix where wetter depressions are found and/or where fires have burned away peat soils.

Vegetation Description

Everglades sawgrass is a medium tall to tall (three meters) grassland with scattered bayheads of short to medium sized broadleaf evergreen trees and shrubs. Vegetation is dominated by sawgrass (*Cladium mariscus* ssp. *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.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| CLMAJ | *Cladium mariscus ssp. jamaicense* | Jamaica swamp sawgrass |
| ELCE | *Eleocharis cellulosa* | Gulf coast spikerush |
| RHTR2 | *Rhynchospora tracyi* | Tracy's beaksedge |
| PAVI2 | *Panicum virgatum* | Switchgrass |
| RHYNC3 | *Rhynchospora* | Beaksedge |
| PANIC | *Panicum* | Panicgrass |
| RHCO7 | *Rhynchospora colorata* | Starrush whitetop |
| SCRH | *Schizachyrium rhizomatum* | Florida little bluestem |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

Moderate to high intensity fires occur at 6-15yr 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 1-5yrs (Florida Natural Areas Inventory 1990). Most of the acreage burns from April to June during the drier, early lightning season. Less common (1-2 per decade) severe fires associated with drought occur primarily from March-May (Gunderson and Snyder 1994).

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).

NatureServe (2006) notes that in the absence of fire, portions of stands will become dominated by Salix caroliniana. If fire continues to be absent, these areas may succeed to Acer rubrum until a replacement fire or mechanical activity restores the marsh.

Fire followed by flooding has been observed to reduce stand density greatly or kill large stands of sawgrass (Herndon 1991).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 3 | 96 | 2 | 15 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) | 76 | 4 |  |  |
| All Fires | 3 | 100 |  |  |

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. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

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

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.

Issues or 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.

Native Uncharacteristic Conditions

Comments

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.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | C | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | C | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | C | C | C | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | B | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | B | B | B | B | B | B | B | B | B | B |
| Tree | 5-10 | D | D | D | D | D | D | D | D | D | D |
| Tree | 10-25 | D | D | D | D | D | D | D | D | D | D |
| Tree | 25-50 | D | D | D | D | D | D | D | D | D | D |
| Tree | >50 | D | D | D | D | D | D | D | D | D | D |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 93 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CLMAJ | Cladium mariscus ssp. jamaicense | Jamaica swamp sawgrass | Upper |
| RHTR2 | Rhynchospora tracyi | Tracy's beaksedge | Low-Mid |
| EREL | Eragrostis elliottii | Field lovegrass | Low-Mid |
| RHCO7 | Rhynchospora colorata | Starrush whitetop | Low-Mid |

Description

Class is characterized by a range of conditions from early post replacement to sawgrass swale. This class is maintained by a moderate intensity, typically growing season fire. Species composition and structure includes primarily sawgrass of varying heights and densities.

*Maximum Tree Size Class*  
None

Class B 4 Mid Development 1 - Closed

DBH

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CLMAJ | Cladium mariscus ssp. jamaicense | Jamaica swamp sawgrass | Middle |
| MOCE2 | Morella cerifera | Wax myrtle | Upper |
| CEOC2 | Cephalanthus occidentalis | Common buttonbush | Upper |
| SACA5 | Salix caroliniana | Coastal plain willow | Upper |

Description

Sawgrass may still be dominant. Class is characterized by a mid-stage sawgrass swale and shrub wetland, and occurs after 10yrs following a post replacement event. Encroaching shrubs include willow, wax myrtle and button bush.

*Maximum Tree Size Class*  
Sapling >4.5ft; <5" DBH

Class C 2 Late Development 1 - Open

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CLMAJ | Cladium mariscus ssp. jamaicense | Jamaica swamp sawgrass | Upper |

Description

Class 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 and many sawgrass stems are killed (Herndon 1991).

*Maximum Tree Size Class*  
None

Class D 1 Late Development 1 - Closed

DBH

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| TAAS | Taxodium ascendens | Pond cypress | Upper |
| RHMA2 | Rhizophora mangle | American mangrove | Upper |

Description

Class occurs as hydric hammock, mixed cypress-hardwood swamp (no water flow) or mangrove swamp (tidal flow).

*Maximum Tree Size Class*  
Sapling >4.5ft; <5" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 9 |
| Late1:OPN | 1 | Late1:OPN | 998 |
| Mid1:CLS | 10 | Late1:CLS | 24 |
| Late1:CLS | 25 | Late1:CLS | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Wind or Weather or Stress | Early1:ALL | Late1:OPN | 0.001 | 1000 | Yes | 0 |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.333 | 3 | Yes | 0 |
| Wind or Weather or Stress | Mid1:CLS | Late1:OPN | 0.001 | 1000 | Yes | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.2 | 5 | Yes | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.333 | 3 | No | 0 |
| Wind or Weather or Stress | Late1:OPN | Early1:ALL | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Late1:OPN | Early1:ALL | 0.04 | 25 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Late1:OPN | 0.001 | 1000 | Yes | 0 |
| Wind or Weather or Stress | Late1:CLS | Mid1:CLS | 0.01 | 100 | Yes | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.025 | 40 | Yes | 0 |

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