14830
South Florida Everglades Sawgrass Marsh

BpS Model/Description Version: Aug. 2020

Modelers		Reviewers	
Clinton Jenkins	Clinton.Jenkins@duke.edu	Hillary Cooley	hillary_cooley@nps.gov
Hillary Cooley	Hillary_Cooley@nps.gov	Rick Anderson	thomas_r_anderson@nps.gov

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**

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

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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