

## **Vital Sign: Wetland Ecotones and Community Structure** [shortened name: Wetland\_Vegetation]

### **Parks Where Vital Sign will be Implemented:**

EVER – SFCN summarizes reports from CERP RECOVER MAP monitoring,

BICY – SFCN will evaluate needs and implement monitoring if warranted

BISC – SFCN will evaluate needs and implement monitoring if warranted

**Justification/Issues being addressed:** Wetland Ecotones and Community Structure ranked 14<sup>th</sup> among the 44 SFCN vital signs. Healthy wet prairies and ridge and slough communities are considered critically important in supporting and restoring the Greater Everglades foodweb. Vegetation also shows visible response over relatively few years to changes in drivers and stressors. The freshwater wetlands community composition in Everglades National Park and Big Cypress National Preserve varies with flow, hydroperiod, fire history, nutrient enrichment, and invasive species. Over the past century, water has been diverted away from the Water Conservation Areas (WCAs), Everglades National Park and Big Cypress National Preserve, resulting in diminished sheetflow, reduced hydroperiods, and increased nutrients. This has been associated with a drying of Shark River Slough and marl prairies in EVER and eastern BICY, loss of tree islands especially in the WCAs, and loss of ridge and slough patterning especially in the WCAs. In addition there are concerns that development to the north of Big Cypress may also lead to diminished water entering the preserve on the northwestern portion of the park coupled with nutrient enrichment of the water that does enter. CERP is intended to rehabilitate flow and hydroperiods and reduce nutrient enrichment. This vital sign is intended to better inform decision-makers regarding the status of these wetlands and directions of change.

### **General Monitoring Questions to be Addressed by the Vital Sign:**

- Are wetland ecotones shifting due to changes in hydrology or other physical factors (e.g., fire, nutrients, and episodic meteorological events.)?
- What are the status and trends in plant community composition and structure?

### **Measures:**

Ridge and slough patterning and depth amplitude, slough to prairie plant composition gradients, number and elevation change in tree islands, wet prairie-forest ecotones change

### **Basic Approach:**

Two large monitoring efforts are already underway in Everglades National Park:

The Comprehensive Everglades Restoration Plan (CERP) RECOVER landscape sub-team is in the process of creating sampling designs and protocols for the first 3 objectives (Philippi 2007) and it is strongly hoped objectives 1 and 3 will be fully funded by CERP and objective 2 will be funded for the Shark River Slough to marl prairies gradient.

An existing Cape Sable Seaside Sparrow habitat monitoring program is underway in the marl prairies where they are found. The program monitors species composition in about 200 plots / year in a stratified random design throughout these areas. Although this program is limited to those areas of marl prairie where the sparrow is found, collaborating with this program could provide valuable information on the status of the marl prairies in addition to the gradients work mentioned above.

SFCN will seek to gather reports from these efforts, summarize them, and link to the MAP annual report summaries as well as provide input through the RECOVER MAP Greater Everglades Module landscape sub-team.

For areas of Big Cypress such as Lostman’s slough and the concerns about changing hydrology in north-western BICY as well as BISC, SFCN will work with park resource management and area researchers to scope out these monitoring needs or determine whether vegetation mapping is sufficient. At that point given priority levels and SFCN funding, SFCN may develop protocols or Standard Operating Procedures (SOPs) as appropriate.

This vital sign also overlaps with the Vegetation Communities Extent and Distribution vital sign. The vegetation map will be used to assess objective 4, e.g., areas where trees and shrubs are encroaching on wet prairies and areas where cattails are increasing or decreasing in extent. It is unclear whether the extent of marshes versus wet prairies can also be established.

Table 1. Plan for Ecotone Monitoring

A= monitored with aerial photography; F= monitored with field plots

	<b>Pineland to Hammock</b>	<b>Coastal to Inland</b>	<b>Forest to Wet Prairie</b>	<b>Wet Prairie to marsh/slough</b>
<b>BISC</b>		<b>A,F</b>	<b>A</b>	
<b>BICY</b>	<b>A,F</b>	<b>A,F</b>	<b>A</b>	
<b>EVER</b>	<b>A,F</b>	<b>A,F</b>	<b>A</b>	<b>A,F</b>
<b>DRTO</b>		<b>A,F</b>		
<b>SARI</b>		<b>A,F</b>		
<b>BUIS</b>		<b>A,F</b>		
<b>VIIS</b>		<b>A,F</b>		

Table 2. Plan for Long-term within-community monitoring plots

+ = SFCN monitoring; ♦ = Existing monitoring program

	Pineland	Hardwood Hammock	Mangroves	Marshes	Island Moist Forest	Island Deciduous Forest	Island Scrub/Shrub
<b>BISC</b>		+,♦	+				
<b>BICY</b>	♦	+	+				
<b>EVER</b>	♦	+,♦	♦	♦			
<b>DRTO</b>			+				
<b>SARI</b>			+	?			
<b>BUIS</b>			+			+	+
<b>VIIS</b>			+		+,♦	+,♦	+

**Principal Investigators/Key Contacts and NPS Lead:**

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- Andrea Atkinson, National Park Service, South Florida/Caribbean Inventory and Monitoring Network. Andrea\_Atkinson@nps.gov, 305-252-0347
- Tom Philippi, Assistant Professor Florida International University, 305-348-1876, philippi@fiu.edu (designed the sampling designs described above)
- Prof. Mike Ross, Florida International University, rossm@fiu.edu, 305-348-1420 (piloted the marl prairie-slough gradients protocol, involved with Cape Sable Seaside Sparrow habitat monitoring)
- Martha Nungesser, Sr. Env. Scientist, South Florida Water Management District, (561) 682-6614, mnunges@sfwmd.gov (piloted the ridge and slough protocol)

**Development Schedule, Budget, and Expected Interim Products:** This is a CERP indicator and is expected to be funded by CERP. A draft sampling design and protocol was reviewed at a workshop by an outside panel in Jan. 18-19, 2007. The approach and monitoring objectives above are based on the results of that workshop. A more complete draft protocol is expected to be submitted to CERP by Tom Philippi of FIU at the end of 2007. Implementation will be dependent upon CERP. SFCN hopes to report the results through the vital signs process. SFCN will scope out the monitoring needs in non-CERP wetlands by 2010 and determine a strategy forward. Table indicates proposed SFCN workload upon full monitoring implementation of all 3 vegetation vital signs

Expected SFCN staff time requirements for all three vegetation vital signs (Wetland Ecotones and Community Structure; Forest Ecotones and Community Structure; Mangrove-Marsh Ecotone )\_once program is fully implemented in 5 years:

<b>SFCN Staff</b>	<b>Full Time Equivalent (FTE)</b>
Coordinator	
Marine Ecologist	
Fisheries Biologist	
Marine Biologist Technician (So FL)	
Marine Biologist Technician (VI)	
Community Ecologist	0.3
Wildlife Technician (Wildlife)	0.4
Wildlife Technician (Vegetation)	0.4
Quantitative Ecologist	0.06
Data Manager	0.04
GIS/Data Tech	0.2
Interns	0.3
<b>SFCN Total</b>	<b>1.7</b>

**References:**

Philippi, Tom. 2007. "Background, Design Issues, and Strawman for Everglades Landscape Monitoring Panel Workshop January 18-29, 2007." Panel of Environmental Monitoring Experts for RECOVER Landscape Monitoring Workshop. January 18-19, 2007. Florida International University. 11 pages.

Michael S. Ross, Jay P. Sah, Pablo L. Ruiz, David T. Jones, Hillary Cooley, Rafael Travieso, James R. Snyder and Sara Robinson. 2004. Effect of Hydrologic Restoration on the Habitat of The Cape Sable Seaside Sparrow: Annual Report of 2003-2004. Southeast Environmental Research Center, Florida International University, Miami, FL, Nov. 30, 2004. 36 pages.