

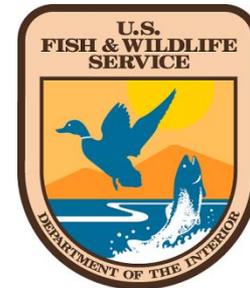
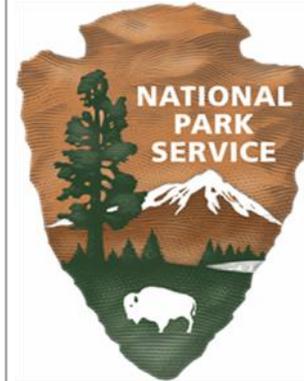


*Protecting the Everglades
One step at a time*

Marsh Vegetation Data: Introduction to the Floristic Assessment Index

Interagency Team:

Rebekah Gibble, USFWS Senior Wildlife Ecologist
Kristin Larson, SFWMD – Staff Environmental Scientist
Matthew Powers, SFWMD – Environmental Scientist
Brad Robbins, SFWMD – Section Leader
Robert Shuford III, SFWMD – Staff Environmental Scientist
Donatto Surratt, EPT - ENP Senior Ecologist
Brent Warner, SFWMD – Supervising Science Technician



May 30, 2012

Technical Oversight Committee meeting



Purpose

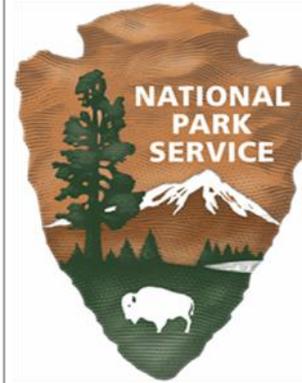
- Provide an update on the technical team's progress in identifying useful protocols for collecting and utilizing vegetation data from the EVPA network

Desired Outcome

- Efficiently and effectively monitor vegetation changes at water quality sites throughout the system
- Develop an effective tool to rapidly assess changes in vegetation and make these data available for ecosystem management

RVA Tool Benefits

- The rapid visual assessment package will result in an index that will facilitate
 - indirect assessment of station-specific and area-specific impacts
 - comparisons among management areas
 - early identification of cattail and potentially other invasive species
 - identification of declines in desirable species

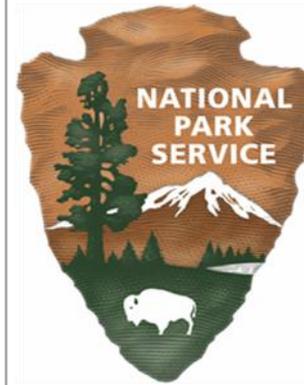




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Rapid Visual Assessment Tool

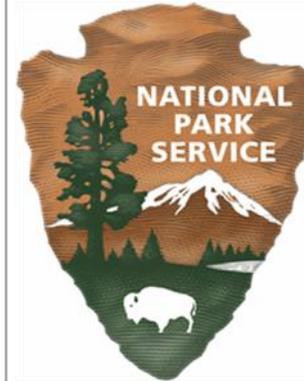
- Composed of two phases
 - Collection of vegetation data
 - Classification of floristic quality
 - Floristic Quality Assessment Index (FQAI)
 - Area specific index of impact (IOI) is built from data classified in the FQAI





Present state of tool development

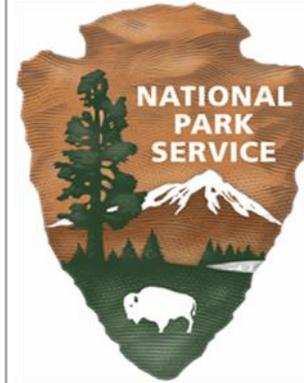
- Technical meetings
 - Four face-to-face meetings between SFWMD and DOI representatives
 - identified basic methods for collecting vegetation information
 - demonstrated the tool used to assess station habitat quality
- Field visits
 - Three field visits to understand
 - present sampling methods
 - potential obstacles in designing consistent vegetation monitoring protocol for the EVPA network
 - SFWMD visited the Refuge twice and worked with Refuge staff
 - DOI staff visited WCA-3A and worked with SFWMD staff





Present state of tool development

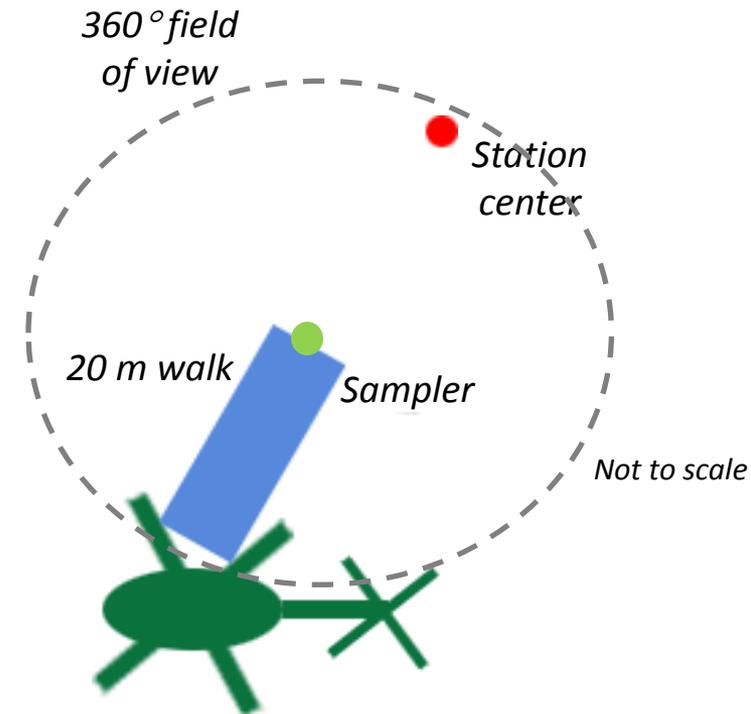
- Sampling protocols established and agreed upon to date
 - Identified a suite of indicator species for the Refuge (7), WCA-2A (6), and WCA-3A (6)
 - Species indicative of impacted or unimpacted stations for each area were selected – *soil TP based*
 - The community structure and combined coverage of indicator species can be used to classify impacted or unimpacted conditions – *vegetation based*





Present state of tool development

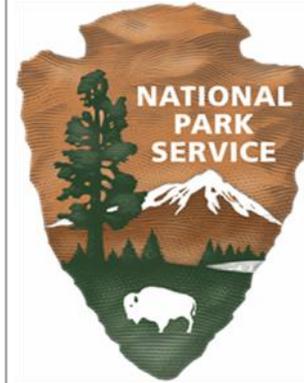
- Basic protocols for sampling a station
 - walk ≥ 20 m from helicopter to sampling location
 - while walking towards the sampling location, identify indicator species within 1 m to either side of the sampler
 - at sampling location, collect emergent vegetation information up to 25 m with a 360° field of view
 - use check box in provided datasheet to record data
 - write-in any other species the sampler has confidence in identifying
 - bring specimens of plants thought to be exotics back to the field office for identification





Present state of tool development

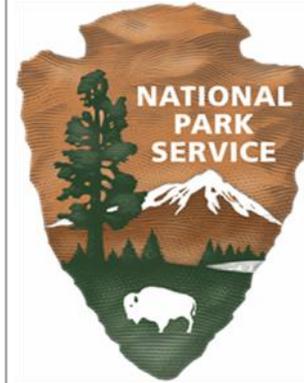
- Training to identify vegetation
 - Training protocols and materials are in development
 - Each sampler will be trained to correctly identify indicator species within selected sample areas
 - Annual continued training
- Standard operating procedure (SOP) language for data collection and recording are in development





Habitat Quality Classification

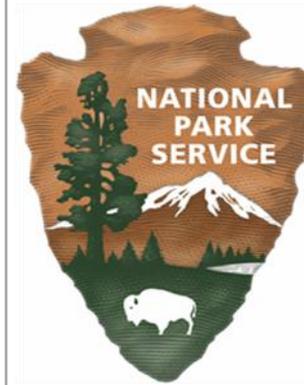
- Floristic Quality Assessment Index
 - Construction and land use changes have altered the floristic quality of vegetative communities in South Florida
 - Regarding natural community conservation the FQAI is “...a powerful tool to assess the quality of natural or remnant native plant communities” (Mortellaro et al. 2009)
 - Floristic Quality Assessment Index (FQAI) was designed to assess the change in quality of these vegetation communities





Floristic Quality Assessment Index

- FQAI
 - ❑ eliminates subjectivity
 - ❑ provides a standard method for evaluating floristic conditions
 - ❑ standardizes station comparisons
- Two major factors are involved in developing the coefficients:
 - ❑ degree of fidelity with regard to a habitat
 - ❑ response to disturbance

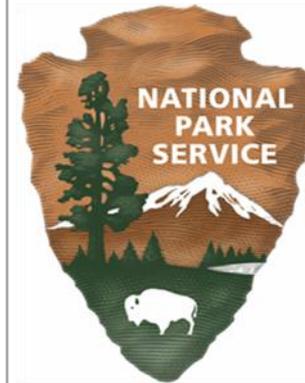




Floristic Quality Assessment Index

- Coefficients of conservatism (CC) for South Florida flora range from 0 to 10 and fall into five guilds:

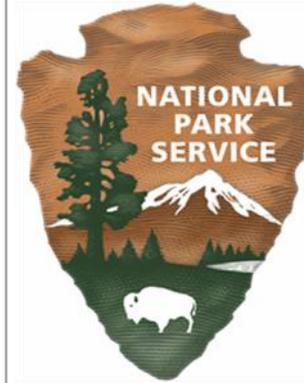
CC guild value	Criteria
0	obligate to ruderal
1-3	varying affinity to ruderal areas
4-6	varying affinity to natural areas; five indicates it's obligate to natural areas; quality of area is low
7-9	varying affinity to high quality natural areas
10	obligate to high quality natural areas





FQAI Applied to LOXA – Case study

- LOXA – The Refuge’s Enhanced Water Quality Monitoring Program
- 37 stations - most located near the perimeter canals bounding the marsh
- Similar protocol to EVPA
- Early 2011, changed protocol for recording vegetation composition at LOXA stations to incorporate the FQAI
 - ❑ Streamlined data collection
 - ❑ Increased consistency and quality of collected data

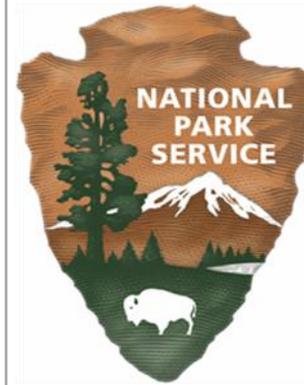




FQAI Applied to LOXA

- Refuge specific taxa and coefficient of conservatism values were selected

Species	Sign	CC
<i>Bacopa carolinensis</i>	+	8
<i>Eleocharis elongata</i>	+	8
<i>Eriocaulon compressum</i>	+	8
<i>Nyphoides aquaticum</i>	+	5
<i>Xyris sp.</i>	+	8
<i>Polygonum spp.</i>	-	3.5
<i>Typha spp.</i>	-	2



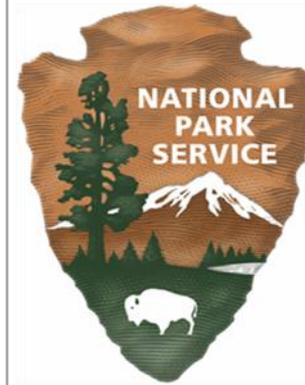


FQAI Applied to LOXA

- Defined a scale of relative plant density (RPD):

Classification	Index Value	Percent Cover
Sparse	1	<10
Moderate	2	10 – 50
Common	3	>50

- Applied coefficients in combination with densities to develop Station Specific Conservatism Values (SSCV)
- SSCVs are grouped into three categories that represent the Index of Impact (IOI)



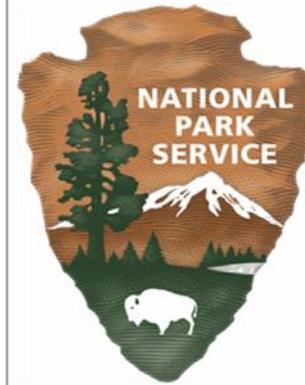


Index of Impact

- Negative values were applied to non-desirable species
- Station specific conservatism value (SSCV)
 - $SSCV = CC * RPD$
 - CC = coefficient of conservatism
 - RPD = relative plant density
- Index of Impact (IOI)
 - Divided into three groups based on SSCV

IOI value	Description	SSCV condition
1	Impacted	<5
2	Moderately impacted	>=5 to <=14
3	Non-impacted	>14





Results

IOI value	Description	SSCV condition
1	Impacted	<5
2	Moderately impacted	>=5 to <=14
3	Non-impacted	>14

STA1W Transect

Month Year	LOXA105	LOXA106	LOXA107	LOXA108
* DFC (km)	0.6	1.1	2.1	3.9
Jul-11				
Aug-11				
Sep-11	-7.00			16.00
Oct-11	-7.00	-10.50	-3.50	8.00

S6 Transect

Month Year	LOXA117	LOXA118	LOXA119	LOXA120
* DFC (km)	0.9	1.8	4.3	6.1
Jul-11	-6.00	16.00	-2.00	8.00
Aug-11	-6.00	16.00	3.00	13.00
Sep-11	-6.00	8.00	8.00	10.00
Oct-11	-6.50	3.00	7.33	7.40

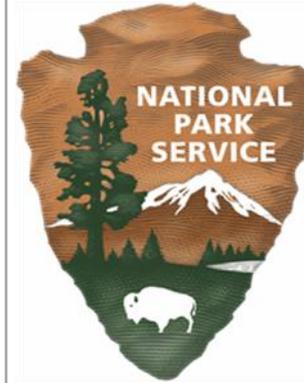
Tracking change over time will be based on annually aggregated IOI's for each station

*Distance from canal



Applications

- Identify spatial and temporal vegetation dynamics
- Temporal representation of:
 - vegetation response to drying and wetting of the Refuge
 - natural variability in vegetation communities (i.e., blooming, senescence, etc.)
- Serves as one indicator of biological dynamics - *Settlement Agreement requirement*
- Enables the exploration of vegetation community patterns with respect to changes in water quality and quantity





References

- Lopez RD, Fennessy MS 2002. Testing the floristic quality assessment index as an index of wetland condition. *Ecological Applications*, v12, 487-497.
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- Jog S, Kindscher K, Questad E, Foster B, Loring H 2006. Floristic quality as an indicator of native species diversity in managed grasslands. *Natural Areas Journal*, v26, 149-167.

