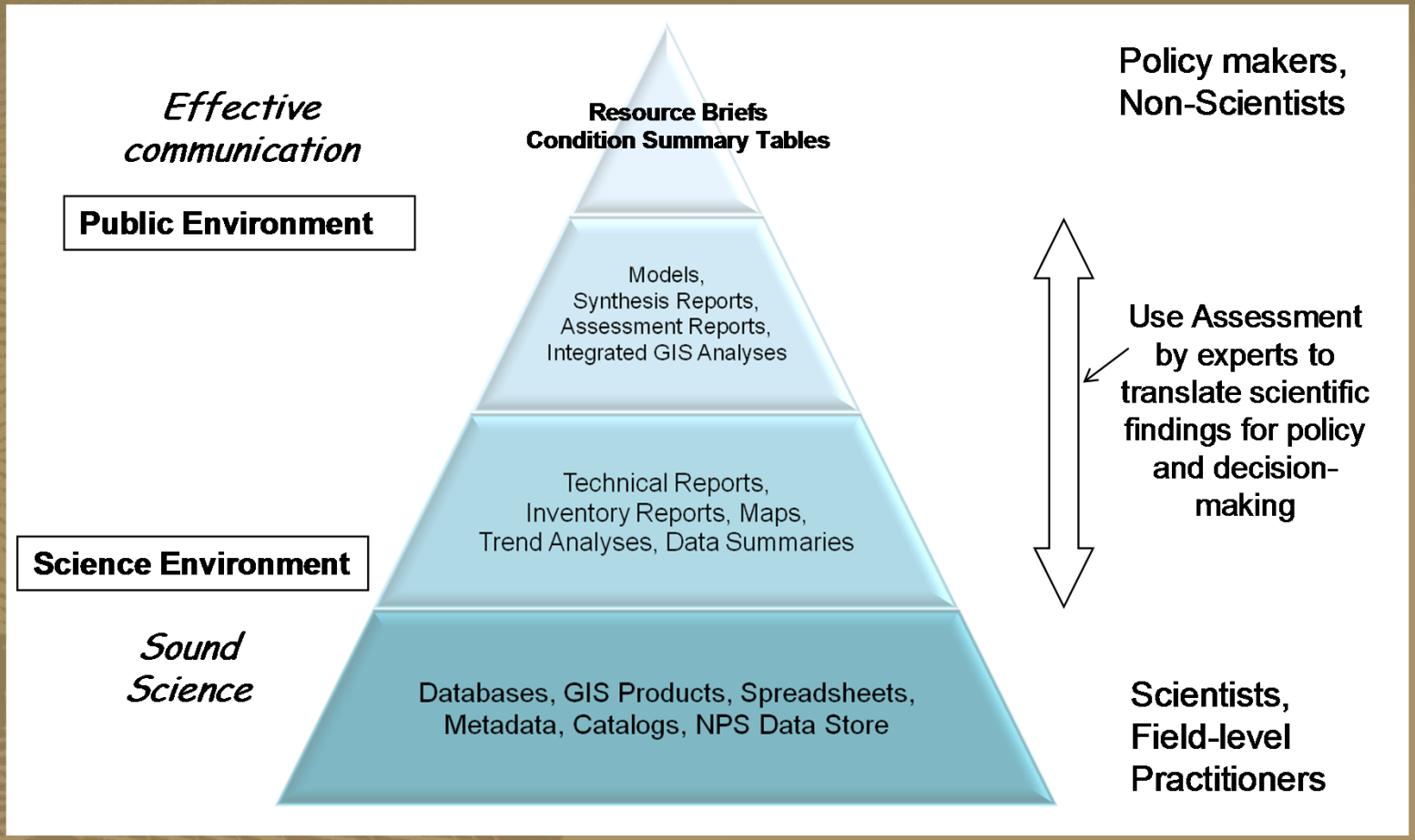
Natural Resource Condition Assessments

Everglades National Park and Big Cypress National Preserve

2015

Greater Everglades Ecosystem Restoration Conference- 4/23/2015

The Information Pyramid. Data and information summarized in a park's Natural Resource Summary Table is supported and documented by a large amount of complex, detailed, credible scientific data and information depicted by the lower levels of the pyramid.



Source: SFCN 2008

NRCA Standard Elements

- All NRCAs are:
  - multi-disciplinary (ecological) in scope
  - report on current conditions across the entire park
  - rely on existing data from NPS and other sources
  - use hierarchical study frameworks
  - emphasize **spatial analyses and reporting products**

Foundational Values (EVER Chapter 2)

- First national park intended foremost to protect biology (1934 enabling legislation)

- Wilderness was a foundational intention:
  - *"The said area or areas shall be permanently reserved as a wilderness, and no development of the project or plan for the entertainment of visitors shall be undertaken which will interfere with the preservation intact of the unique flora and fauna and the essential primitive natural conditions now prevailing in this area."* (Public Law 48 Stat 816, section 4)

- Restoration is an enduring legislative theme:
  - *"The Secretary shall manage the park in order to maintain the natural abundance, diversity, and ecological integrity of native plants and animals, as well as the behavior of native animals, as a part of their ecosystem."* (Public Law 101-229)

Foundational Values (BICY Chapter 2)

First National Preserve created in the US - a combined mission to protect recreational activities, rights to resource use by indigenous people, natural resources, and ecological processes. (Public Law 93-440 - 1974 enabling legislation)

- Recreational fishing, hunting, and ORV use are key management priorities:
  - Although there is a combined mission for BICY as a national preserve, the prevention of impairment of park resources is a priority and conservation is the predominant value when a conflict between protection and conservation of resources occurs (NPS Management Policies 2006, pg. 2).
- Indigenous use, economic development and well-being
  - Both the Seminole and Miccosukee Tribes have rights to subsistence harvests of mammals and fish, as well as right of first refusal to provide concession services within the preserve (Public Law 93-441, 1974).
  - “In fact, the Tribe's identity is so closely linked to the land that Tribal members believe that if the land dies, so will the Tribe.” (Seminole Tribe website, http://www.semtribe.com/Culture/SeminolesandtheLand.aspx, accessed 5/22/2013).

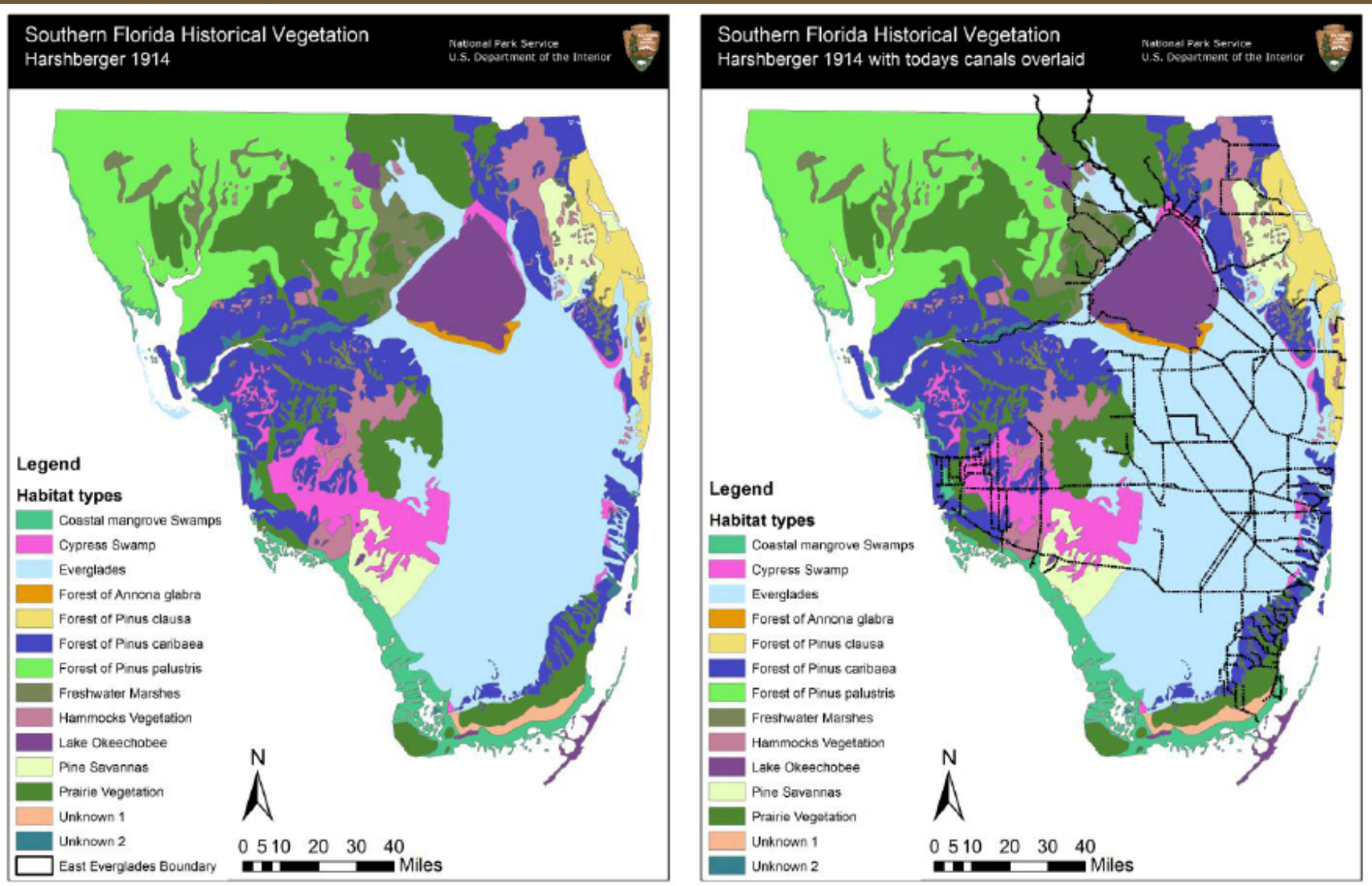


Figure 4.4. A digitized version of Harshberger 1914 (left panel) and the same map with the current canal system overlaid (right panel).

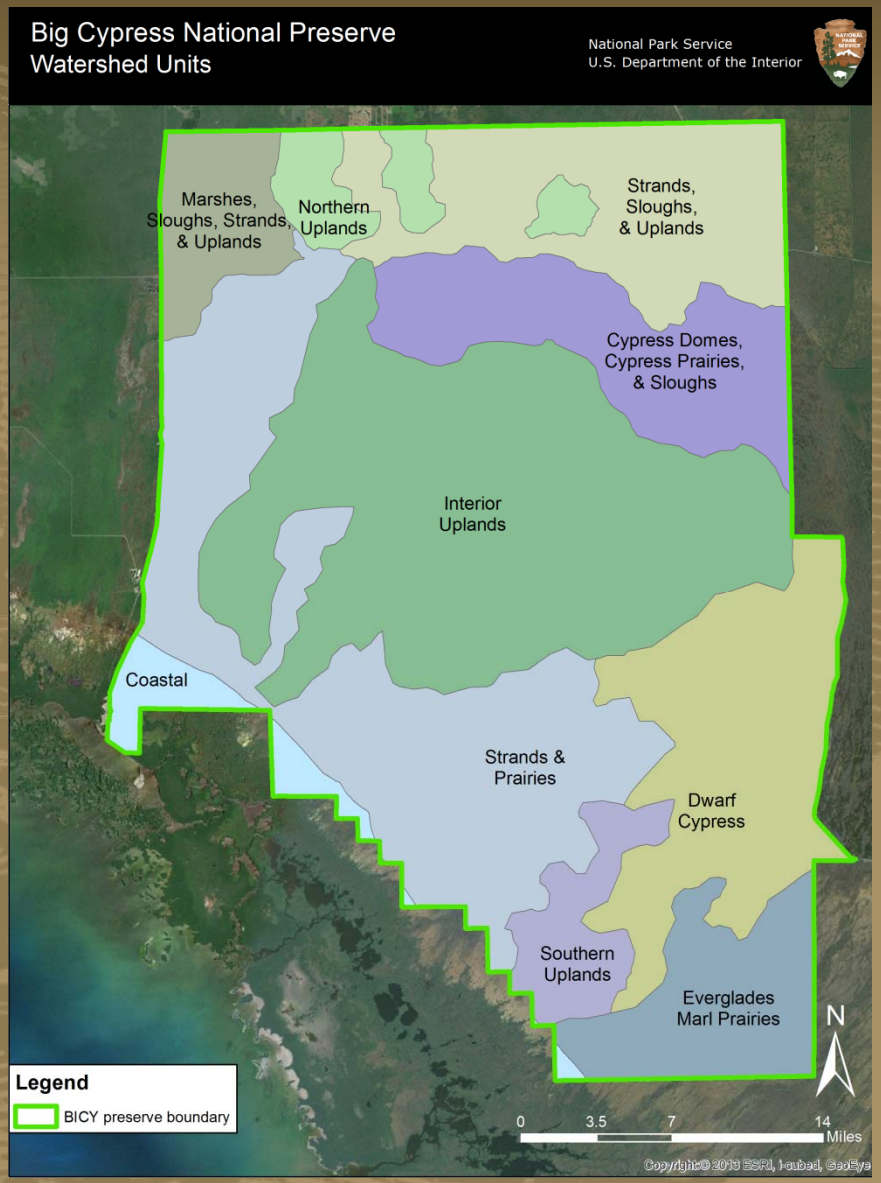
Comprehensive Nature of Assessments

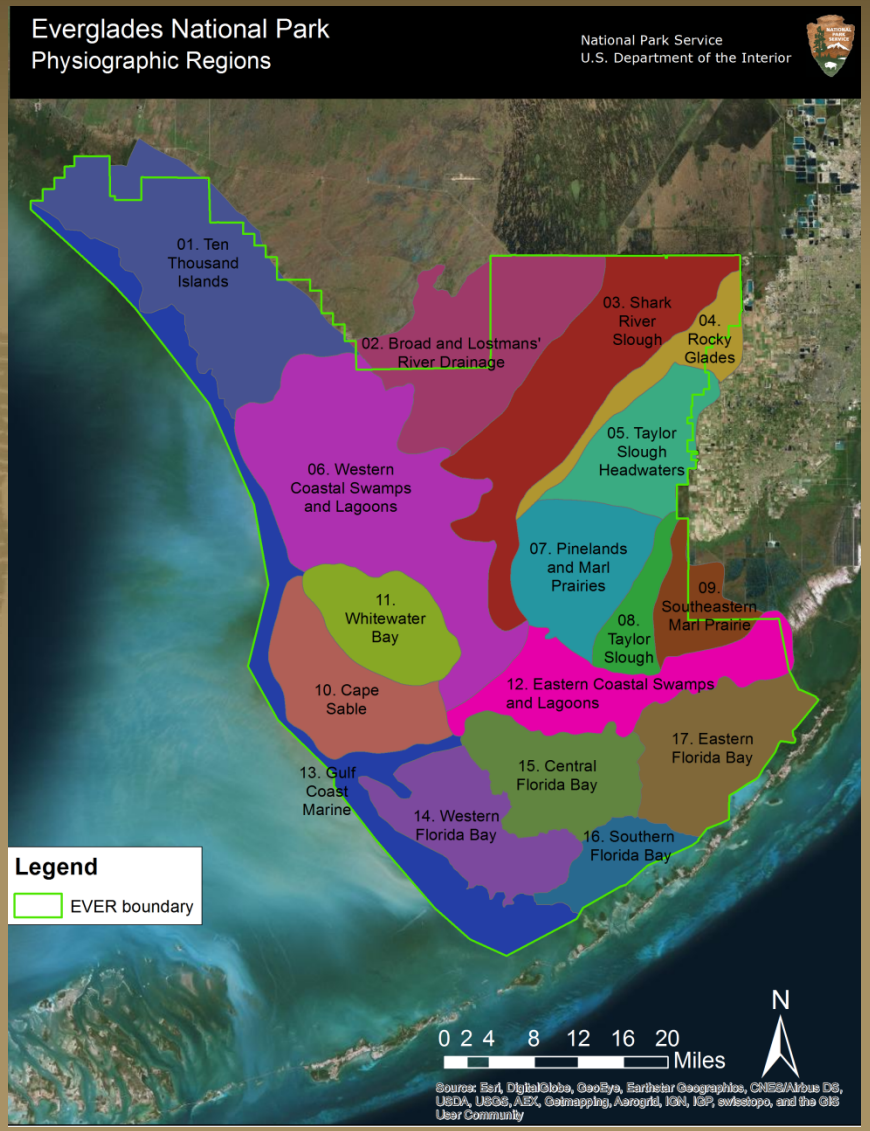
EVER

- ~310 pages
  - 100 Figures
  - 65 tables
  - 30 photos
- Chapter 4 – 27 sections with 19 unique authors
- Chapter 3/5 – National Assessment framework supports spatially-explicit synthesis

BICY

- ~250 pages
- Chapter 4 – 19 sections
  - Wildlife management – key theme
  - Fire, T&E species, pathogens
- Chapter 3/5 – National Assessment framework supports spatially-explicit synthesis


Big Cypress National Preserve
Watershed Units
National Park Service
U.S. Department of the Interior
Marshes, Sloughs, Strands, & Uplands
Northern Uplands
Strands, Sloughs, & Uplands
Cypress Domes, Cypress Prairies, & Sloughs
Interior Uplands
Coastal
Strands & Prairies
Dwarf Cypress
Southern Uplands
Everglades Marl Prairies
Legend
BICY preserve boundary
0 3.5 7 14
Miles
N
Copyright© 2013 ESRI, i-cubed, GeoEye


Everglades National Park
Physiographic Regions
National Park Service
U.S. Department of the Interior
01. Ten Thousand Islands
02. Broad and Lostmans' River Drainage
03. Shark River Slough
04. Rocky Glades
05. Taylor Slough Headwaters
06. Western Coastal Swamps and Lagoons
07. Pinelands and Marl Prairies
08. Taylor Slough
09. Southeastern Marl Prairie
10. Cape Sable
11. Whitewater Bay
12. Eastern Coastal Swamps and Lagoons
13. Gulf Coast Marine
14. Western Florida Bay
15. Central Florida Bay
16. Southern Florida Bay
17. Eastern Florida Bay
Legend
EVER boundary
0 2 4 8 12 16 20
Miles
N
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

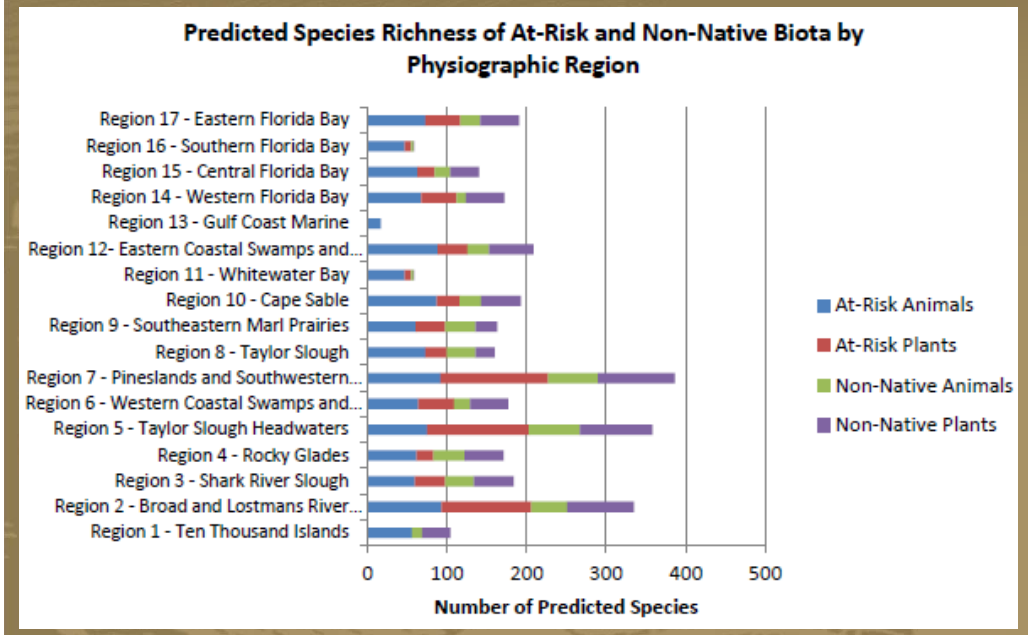
Distinguishing features from other large-scale assessments

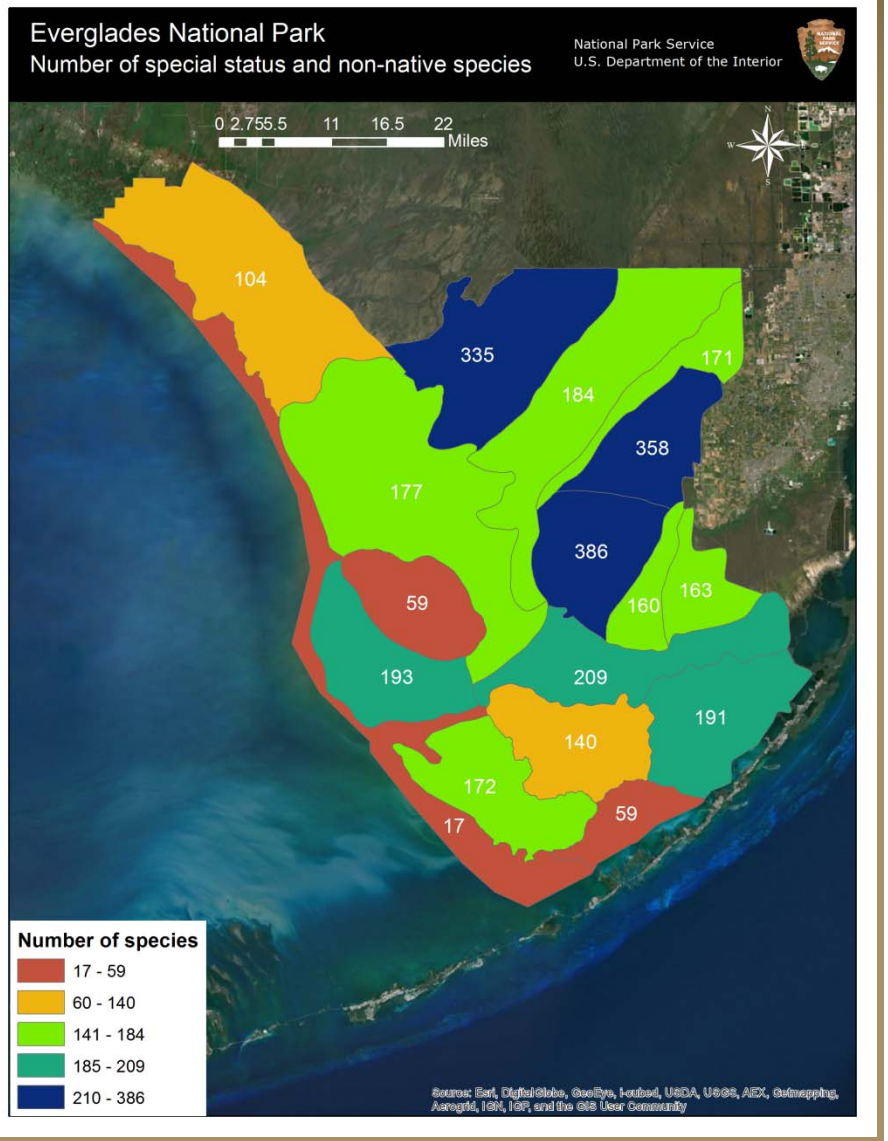
- Visitation – temporal patterns, economic impacts and systematic description of visitor perspectives (Ch 2)
- Air quality, Night skies, Soundscapes (BICY) – NPS has made significant progress on assessing these subjects nation-wide

- Written in the voice of the National Park Service
  - Informed by institutional traditions, but not bound by them
  - Leopold Report – foundations of wildlife management
  - Emphasis on open dialogue, empowering behaviors, and a learning-focused atmosphere – a foundation for effective…

Stewardship

First time assessments





Spatial patterns of Biodiversity concerns (special status species) and challenges (non-native species) are co-located!

Non-natives – overall proportions and food-web associated risks

Table 4.39. Assessment of biodiversity risks in the five major guilds across the 17 regions of EVER.

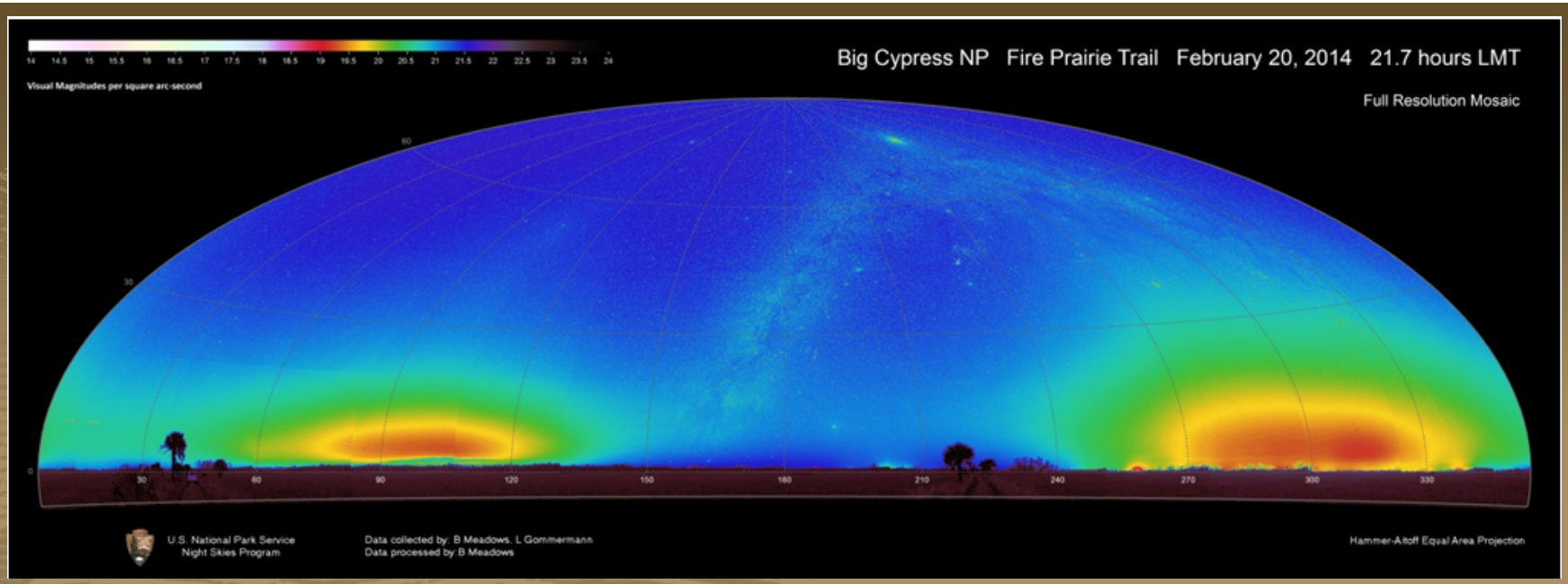
Species group	Assessment Category	Region 1 – Ten Thousand Islands	Region 2 – Broad and Lostmans' River Drainage	Region 3 – Shark River Slough	Region 4 – Rocky Glades	Region 5 – Taylor Slough Headwaters	Region 6 – Western Coastal Swamps and Lagoons	Region 7 – Pinelands and Marl Prairies	Region 8 – Taylor Slough	Region 9 – Southeastern Marl Prairie	Region 10 – Cape Sable	Region 11 – Whitewater Bay	Region 12 – Eastern Coastal Swamps and Lagoons	Region 13 – Gulf Coast Marine	Region 14 – Western Florida Bay	Region 15 – Central Florida Bay	Region 16 – Southern Florida Bay	Region 17 – Eastern Florida Bay
birds	proportion nonnative	2%	2%	2%	1%	2%	7%	6%	3%	1%	2%	2%	2%	0%	1%	3%	2%	3%
	meltdown risk	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
mammals	proportion nonnative	20%	18%	22%	19%	12%	27%	24%	19%	17%	15%	0%	19%	0%	15%	17%	0%	25%
	meltdown risk	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.0	0.3	0.0	0.3	0.3	0.0	0.4
fish	proportion nonnative	0%	8%	19%	23%	3%	23%	20%	20%	20%	2%	0%	1%	0%	1%	1%	0%	7%
	meltdown risk	0.0	0.1	0.2	0.2	0.0	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
reptiles	proportion nonnative	37%	29%	26%	41%	26%	47%	44%	32%	48%	27%	8%	26%	NA	10%	38%	8%	24%
	meltdown risk	0.5	0.3	0.3	0.4	0.3	0.6	0.5	0.4	0.5	0.4	0.1	0.3	0.0	0.1	0.5	0.1	0.3
amphibians	proportion nonnative	0%	17%	13%	18%	14%	18%	18%	13%	19%	15%	0%	18%	NA	15%	25%	0%	15%
	meltdown risk	0.0	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.2	0.0	0.2	NA	0.2	0.3	0.0	0.2

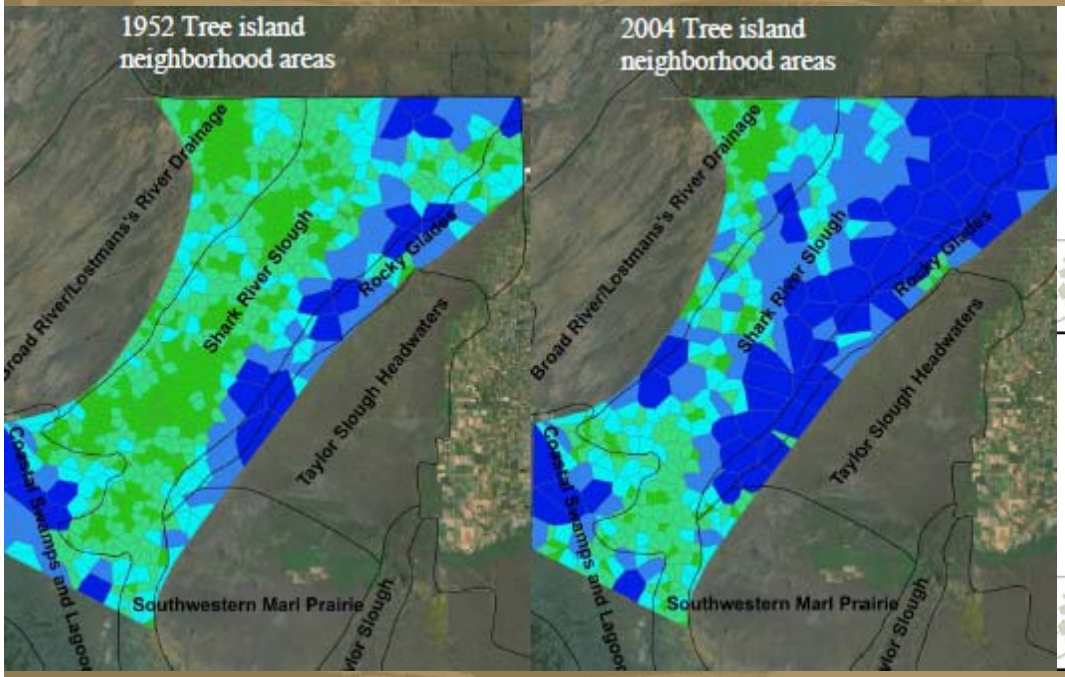
Table 4.38: Percentage of Non-Native Species in Florida found in EVER.

Taxonomic Group	#Non-Native Species	% Total Non-native Species in Florida (EDDmaps.org)	Region(s) where most Non-native species occurring
Birds	22	15% (out of 147 total)	6, 7
Mammals	9	35% (out of 26 total)	6, 7
Fish	11	32% (out of 34 total)	2, 3, 8
Reptiles	26	19% (out of 135 total)	2, 6, 7
Amphibians	3	21% (out of 14 total)	All regions except 1 and 16
Plants	243	59% (out of 413 total)	2, 6, 7

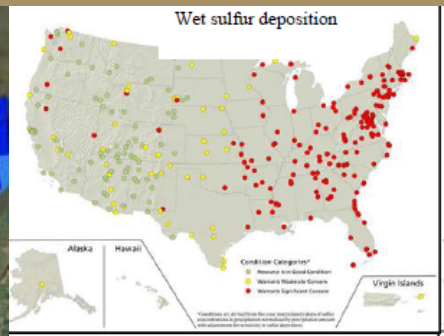
Table 4.34. Summary of number of species in EVER. Native species, non-natives, and at-risk native species counts are presented as counts and proportions.

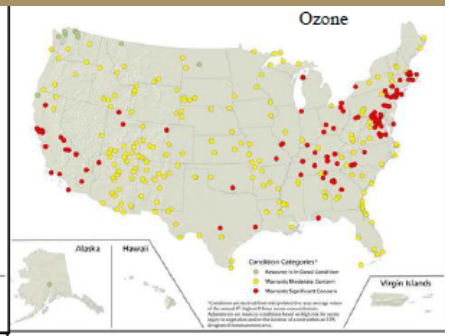
Taxonomic Group	Estimate of Native Species	% of all species that are Native	#At-risk Species	% of native species that are At-risk	#Non-Native Species	% of all species that are Non-Native	Total species
Birds	341	93.94%	71	20.82%	22	6.06%	363
Mammals	41	82.00%	15	36.59%	9	18.00%	50
Fish	385	97.22%	14	3.64%	11	2.78%	396
Reptiles	68	72.34%	10	14.71%	26	27.66%	94
Amphibians	19	86.36%	0	0.00%	3	13.64%	22
Plants	732	71.55%	151	20.63%	291	28.45%	1,023
Total	1,586		261		362		1,948

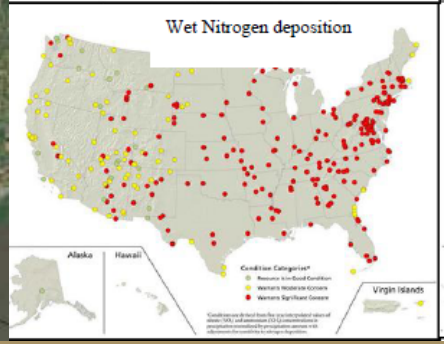

Visual Magnitudes per square arc-second
Big Cypress NP Fire Prairie Trail February 20, 2014 21.7 hours LMT
Full Resolution Mosaic
U.S. National Park Service
Night Skies Program
Data collected by: B Meadows, L Gommermann
Data processed by: B Meadows
Hammer-Aitoff Equal Area Projection

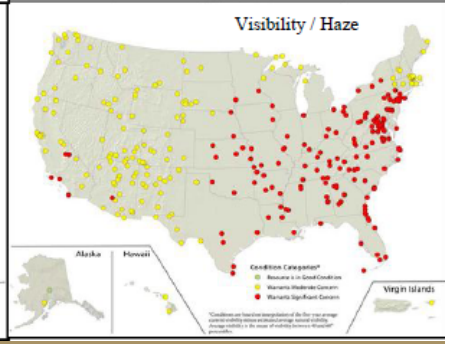

1952 Tree island neighborhood areas
Broad River/Lostmans's River Drainage
Shark River Slough
Rocky Glades
Taylor Slough Headwaters
Coastal Swamps and Lagoon
Southwestern Marl Prairie

2004 Tree island neighborhood areas
Broad River/Lostmans's River Drainage
Shark River Slough
Rocky Glades
Taylor Slough Headwaters
Coastal Swamps and Lagoon
Southwestern Marl Prairie


Wet sulfur deposition
Alaska
Hawaii
Virgin Islands


Ozone
Alaska
Hawaii
Virgin Islands


Wet Nitrogen deposition
Alaska
Hawaii
Virgin Islands


Visibility / Haze
Alaska
Hawaii
Virgin Islands


Judd Patterson, 2008
www.juddpatterson.com

Thanks!


© Judd Patterson, 2008