River *of* Grass Restoration Reserve

To the

Water Resources Advisory Commission, *and*

The Governor and the Florida Department of Environmental Protection,
the South Florida Water Management District,
and the Florida Department of Agriculture and Consumer Affairs

Karl Wickstrom and Forest Michael

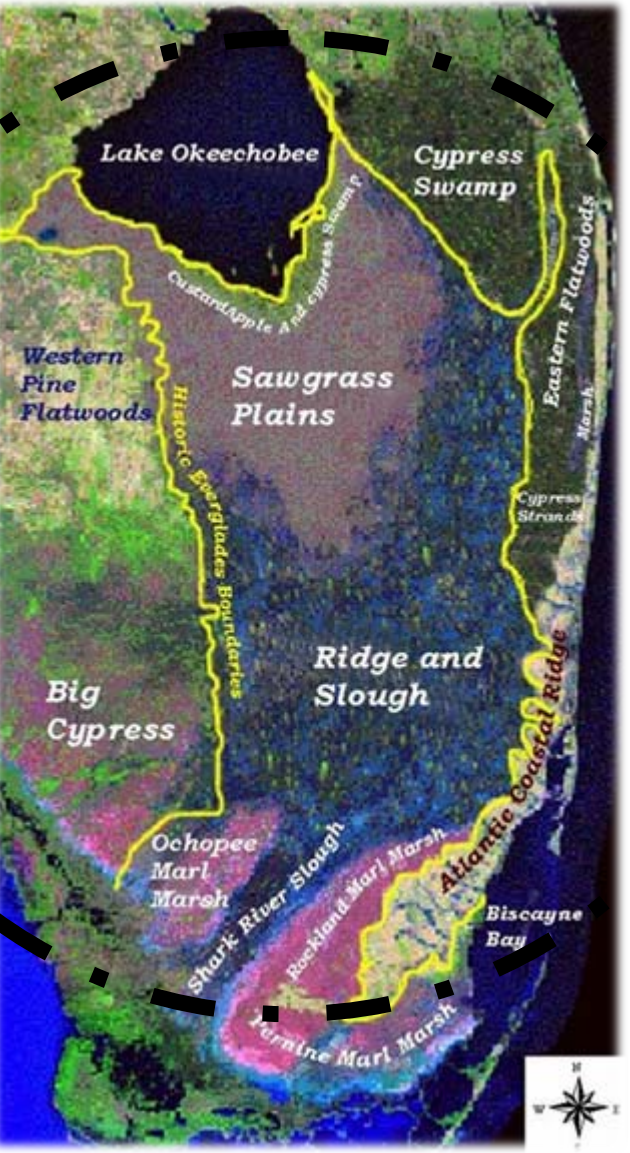
SFWMD River of Grass Planning
Release 3; February 2009
Contact: michaelplanning@gmail.com

THE EVERGLADES, FLORIDA

Maximum benefits for all

The River *of* Grass Restoration Reserve is a concept to transform most of U.S. Sugar Corporation's drained fields into a huge public system of wetlands and waterways, providing a multitude of benefits for the environment, lake communities, agriculture and for the general public.

River of Grass Restoration Reserve approach images (from other sources)



Historic Ridge and Slough diagram, NOAA

River *of* Grass
Restoration Reserve – *initial goals*

Remove the “compartments” that fragment the Everglades, and remove estuarine impacts with a lake storage flowway to the south;

Restore the ecology with maximum water filtering, and habitat and wildlife;

Implement the system in affordable and sustainable steps;

Provide city waterfronts, agricultural areas and a higher quality of life.


Healthy estuaries and fisheries
result in healthy economies!

Karl Wickstrom

- Rivers Coalition Board
- Everglades Foundation Board
- Florida Oceanographic Society Board
- Florida Sportsman Founder

"Openers" column: Proposing a Unique New Reserve

"**February 2009** The people of Florida have a truly amazing opportunity. Purchase 180,000 acres of overdrained and tainted sugar land in order to restore Mother Nature's long lost River of Grass. That's a dream we've nurtured for a half-century.

The Deal to buy US Sugar's property will reconnect Lake Okeechobee to the Everglades, save the estuaries from horrendous discharges, rebuild groundwater systems and reduce phosphorous fertilizer pollution by hundreds and hundreds of tons. Those benefits alone are more than enough to justify the buy, at a price that will be viewed as a can't-miss bargain compared to the public good. And we'd suggest this icing on the cake:

The River of Grass Restoration Reserve

This new Reserve could transform the immense property (the size of many state parks combined) into a natural wonderland, while at the same time provide vitally needed basic benefits of the Missing Link flowway. **Imagine a network of waterways offering all kinds of public uses such as:**

- Many miles of canoe and kayak access
- Nature trails rarely enjoyed anywhere
- World-class birding drawing millions
- Extraordinary freshwater fishing
- Duck hunting supreme in certain areas
- Vistas of Glades life in large scale
- Important educational centers

"Openers" column: Proposing a Unique New Reserve

continued…

Lake communities could benefit in many ways. It could be a significant part of a needed economic program to aid folks on the south side of the lake. The Reserve idea hatched after we visited Guana Reserve just north of St. Augustine. Guana covers 55,000 acres and offers many of the same features envisioned for the River of Grass Reserve. Take a look at www.nerrs.noaa.gov/GTM.

It's exciting to think of the possibilities. First, of course, we must acquire the sugar land. There are naysayers picking at details of the purchase. The hidden hand of certain agricultural interests is in the background. And some observers worry that U.S. Sugar owners will make an undeserved bundle in the deal.

Actually the price equivalent to $7,000 an acre is something the public can live with, especially considering that there is no real alternative. The contract closing is slated for later this year.

Get it done, we say, and tie in the Restoration Reserve that would gain world wide appeal and significance."

- - Karl Wickstrom






Forest Michael, Communities, Greenways and Blueways

Project management, master planning and landscape architecture on a variety of public projects; previous public service to the Florida Greenways Commission and other entities.

Lake Okeechobee, Florida National Scenic Trail and Blueway (70 mi. FDOT, FDEP, SFWMD, USACE, BIA, Seminole Tribe, Glades, Hendry, Okeechobee; other Lake O. based projects)
Florida Keys Overseas Heritage Trail, Blueway (FDEP, FDOT, SFWMD, NPS, Monroe County)
Big Cypress National Preserve Trailheads (NPS, and Agency and Florida Partners)
Babcock Ranch Greenway and Transit (Kitson Babcock, FDOT, Lee and Charlotte)
Sustainable Okeechobee Village and Waterfront (Okeechobee County, USACE, FDOT, FDCA)
Tamiami Trail National Scenic Byway (Master Plan, FDOT Dist.1, NPS, ENP, BCNP)
Cross Florida Greenway Landbridge (FDOT, FDEP, Marion County, FTA)
Central Florida Loop Greenway and Blueway (300 mile; FDEP, FDOT, recipient of Governor Chiles' Proclamation as an official State of Florida Greenway)
Genius Reserve, Restoration (Genius Foundation, Rollins College/1000 Friends Award)
Florida Greenways Commission (FGC Central FL Task Force Chair, and FRTC/FDEP, and RTC-FL)
City of Winter Springs Town Center & FNST (FDEP, FDOT, USDA, Florida Forever Grant)
City of Winter Park Central Park (Including historic Rose Garden and Train Station)
Town of Rosewood, FL (Defining the historic town, railroad, cemetery and various sites)
Cape Hatteras National Seashore (NPS Historic Lighthouse relocation, Environmental Assessment)
Community and Greenway Plans Nationwide (National award – USACE, USAFCEE- AETC)
River of Grass Restoration Reserve /Lakes Concept (Current ecoreservoir program initiative)
Caloosahatchee Riverway Concept (Current initiative for multiuse water storage/quality)





Michael Planning Team, Established 1983, LA0000751, 407 340-5051, michaelplanning@gmail.com

Planning:

Lakes Technology

Layout

Reserve

Planning:

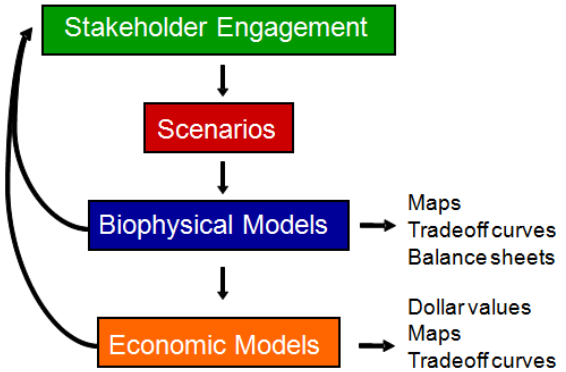
Lakes Technology

Layout

Reserve

Supportive Documents

Water Resources Development Act (WRDA)
Comprehensive Everglades Restoration Plan (CERP)
Florida Save Our Rivers
Florida Preservation 2000 and Florida Forever
Florida Comprehensive Growth Management
Florida Greenways and Trails
Florida Energy Commission
Rivers Coalition
Seminole Tribal Writings on the environment
Everglades Coalition's and Audubon's writings as of 2009
USACE, NPS and State of Florida environmental plans
USACE levee seepage cutoff wall technologies reports



Ecoreservoir Lakes Technologies (Lakes Technology)

Pre-1980 Florida Reservoirs (the native vegetated edges, not including the dams) (1929 Lake Talquin State Park; 1967 Lake Manatee, etc.)

EcoReservoir Program © 2007, F. Michael (Federal and State of Florida best practices; other innovations; use prohibited without consent; Restoration Reserve uses ecoreservoir technology)

Economic Models
Large-scale modeling of economic and natural opportunities and costs

Water Capability in this approach for USSC land

1 million acre-feet storage (ecoreservoir lakes /some stacking)

Integral water quality (ecosloughs /hammocks, glades…)

Storage balance per science in the Kissimmee River and Okeechobee Watersheds (in a "Distributed System" with landowner and local government compensation)

Agriculture – continued prosperity

Provide ~20% USSC land for continued Ag (private leases handled by the Reserve's "commission" with local representation)

Slow, defined transition (assure cities that a slow transition is planned and the mills will have known Ag customers for definite periods)

Current restoration practice in the Everglades

Historic River of Grass, sawgrass flowway

Unsustainable carbon usage

Design similar to Tampa Bay reservoir

Not per DOI and science decompartmentalization

Note: the River of Grass Restoration Reserve does not propose this type of construction

Tampa's "Water Worries" Cracked Reservoir

Tampa's is ~1 /4 size of the CERP C-43 Reservoir and a similar design as the EAA A-1 Reservoir.

Tampa Bay Water Sues Over Reservoir Cracks

By STEVE ANDREWS | News Channel 8 ; Published: Updated: 12/10/2008

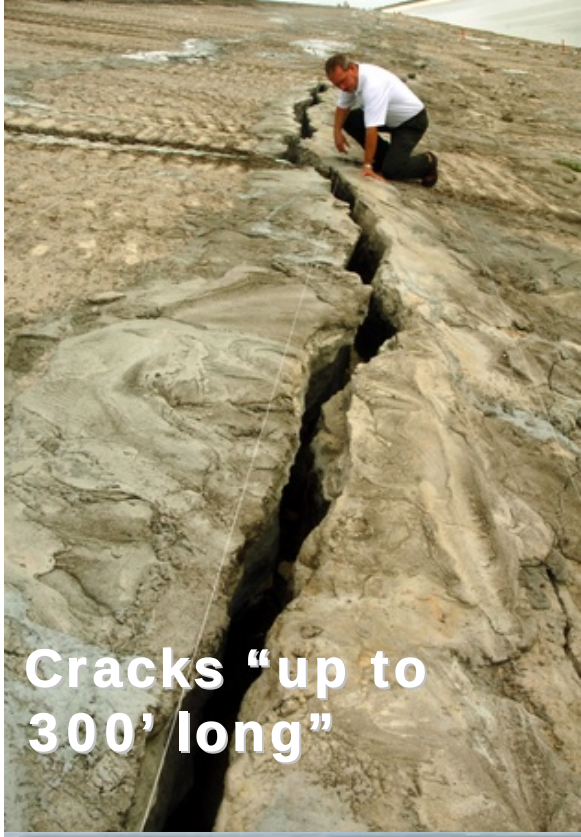
Tampa Bay Water filed a lawsuit today against three companies seeking compensation for cracks that have damaged the walls of the C.W. "Bill" Young Regional Reservoir in south Hillsborough Co.

The lawsuit alleges the cracks are the result of a faulty design by HDR Engineering Inc., that Barnard Construction Co. failed to build the reservoir according to the design, and cites poor construction maintenance by Construction Dynamics Group.

"We didn't get what we paid for, and we plan to hold the companies responsible for design and construction accountable for their work," said Gerald Seeber, general manager of Tampa Bay Water. "We don't expect the ratepayers to bail out the contractors."

The lawsuit does not ask for specific monetary damages. The utility has spent about $1 million so far investigating and filling the cracks. Seeber said the costs could rise to $2 million by May. All of that, he said, is considered a temporary fix. The cracks have had engineers puzzled since they first appeared in December 2006. The latest theory is that water underneath the soil-cement inner wall is not draining adequately. "The water that saturates that soil wedge isn't leaving and falling through the soil as quickly as it should," he said. "That differential in water pressure is what we're addressing, and that is what we believe is causing the cracking." Seeber said Tampa Bay Water engineers should be able to pinpoint the exact cause of the cracks and have a preliminary plan to repair them by June. Constructing a permanent fix may not be completed until 2013.

"That process of designing and constructing a fix will take us about four-and-a-half to five years…" (Tampa will instead pump from Floridan Aquifer, which is already depleted) The $146 million reservoir went into operation in June 2005. Larger-than-expected cracks first appeared in December 2006. **Some measured 4 inches wide and up to 300 feet long.** Tampa Bay Water poured a grout mixture into the cracks. In many cases, the repairs did not hold. After the holidays, Black & Veatch, the agency's system engineer, plans to conduct ground-penetrating radar tests around the perimeter of the reservoir. Engineers want to know if the dirt lying beneath the soil cement has eroded away. If so, they need to repair any voids. The tests will cost the agency $191,000.

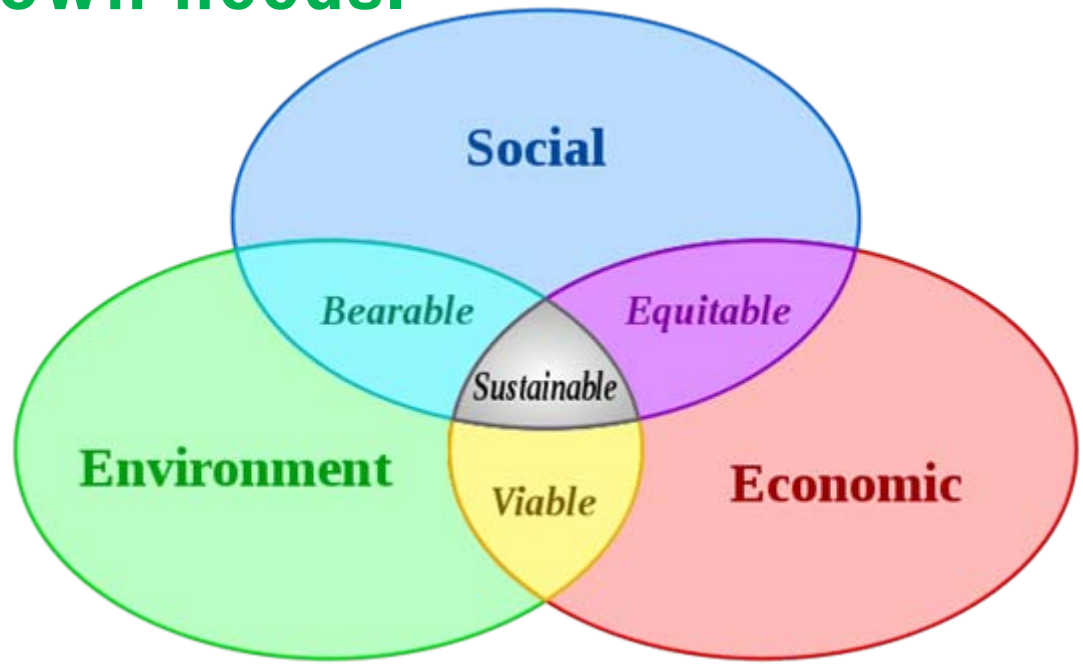


Note: the River of Grass Restoration Reserve does not propose this type of construction

Sustainability:

The term was used by the Brundtland Commission which coined what has become the most often-quoted definition of sustainable development as development that

"meets the needs of the present without compromising the ability of future generations to meet their own needs."



Lake Talquin (Reservoir) FL State Park, 1929

Kupferbach Reservoir, Germany, 1929

Lakes Technology (not including dams)

River of Grass Restoration Reserve
Ecoreservoir Lakes Model

Lakes Technology

River of Grass Restoration Reserve
Ecoslough Model for a “Glade”

This is the right time for a low carbon technology

2008, US GAO and National Academy of Science: the restoration is substantially over budget and behind schedule.

2008, Low Carbon Economy: Everglades and economic restoration are beginning a **"lower carbon"** era. **Agribusiness already is.**

2008, Sustainability: governmental and private incentives for green businesses; FL Energy Commission; Green Lodging...

2009, Economic Crisis: avoid more highly expensive "re-builds" (EAA A-1; Kissimmee River C38 channelization; etc.)

2009, Floridians: planning the purchase for the River of Grass.

2009, FDEP, SFWMD: beginning the River of Grass Planning

- Alternative selected by June/July
- Preferred plan by August
- Real estate closing by "September"

Ecoreservoir (Lakes) Program

As applied to the US Sugar Corp. lands, Everglades

In the Everglades Agricultural Area (EAA) and other areas

Previously presented to WRAC, and others (Caloosahatchee: Oct. 2008, Dr. Bill Hammond, previous Governing Board; and Jul. 2008, F. Michael)

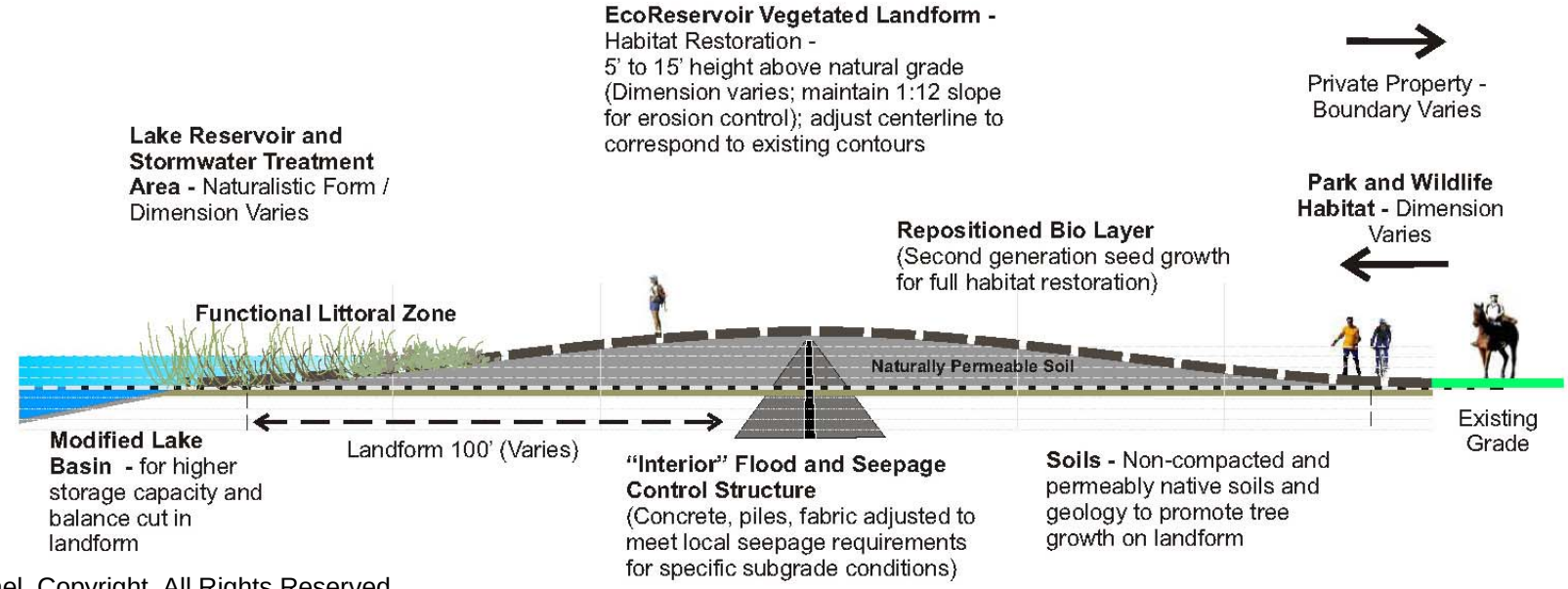
Integrates Best Practices:

- **FL Dept. of Environmental Protection:** State Parks; Greenways; Ecotourism;
- **FL Game and Fish Conservation Commission:** Habitat; Wildlife;
- **FL Dept. of Agriculture and Consumer Affairs:** Green Markets; Water;
- **FL Dept. of Community Affairs:** Growth Management; Communities;
- **South Florida Water Management District:** Some STA Science; Environment;
- **US Dept. of Agriculture:** Levee Design; Green Agriculture;
- **US Fish and Wildlife Service:** Habitat; Wildlife; Recreation; Management;
- **US Army Corps of Engineers:** Cutoff Walls; Seepage; Environment; Flood Safety;
- **US Environmental Protection Agency:** Watershed Management; Quality;
- **National Parks Service:** Watershed Protection; Resource Protection; Design;
- **Department of Defense:** Environmental Excellence; Sustainable Design;
- **Bureau of Land Management:** Watershed and Resource Protection; Agriculture;
- **Others**

Ecoreservoir (Lakes) Program (applied to USSC land)

Component: **Landforms** (water containment)

1. **Containment component for ecoreservoir /lakes**
2. **Internal (hidden) seepage control structure**
   - Concrete cutoff walls; or sheet pile; or other; porous native soils
3. **Vegetated /sheer control and habitat restoration**
4. **Reflects natural lake terrain** (Lake Okeechobee Ridge, etc.)
5. **Flood protection** (non-breachable design)



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Ecoreservoir (Lakes) Program (applied to USSC land)

Component: **Ecoreservoir Lakes**

1. **Storage component** (capacity per Science Group analysis if possible)
2. **Appears as a natural lake** (most lakes)
3. **Interconnected flow** (chain of lakes; watershed)
4. **Water quality component** (natural settling, littoral zones, etc.)
5. **Flow regulation** (natural equalization of water flow pulses)
6. **Eutrophic** (productive lakes, large amounts of plants, fish and animals)

Ecoreservoir (Lakes) Program (applied to USSC land)

Component: **Ecosloughs** (hammocks, marshes, glades)

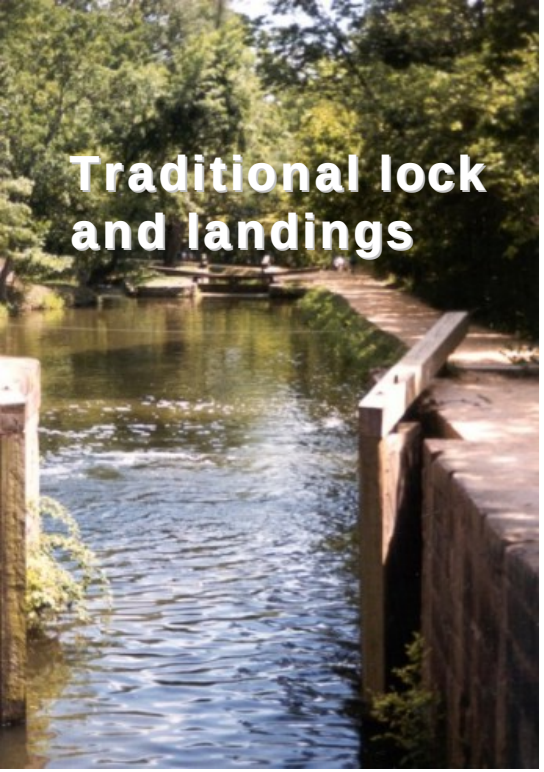
1. **Shallow storage component** (capacity varies)
2. **Appears natural** (universal; marsh, hammock, glades, wetlands)
3. **Stormwater quality** (linear and natural filtration using vegetation and flow control to filter pollutants and turbulence)
4. **Interconnected flow** (Water source inflow to lake storage system; then release into reservoir/lake following initial treatment)
5. **Flow regulation** (natural equalization of water flow pulses prior to water entering reservoir/lakes)

Fakahatchee Strand

Pond Apple

Glade


Traditional bridges allowing
watercraft access



Ecoreservoir (Lakes) Program

Component: **Structures** (Weirs, spreader outfalls)

1. **Weirs** (do not use; if needed then use as park features)
2. **Spreader inflows and outflows** (widened flow areas relying on stages for more natural flow control)
3. **Waterfalls** (park features for ecotourism areas of interest, and water control; clad with native stone)
4. **Flow regulation** (natural equalization of water flow pulses prior to water entering Ecoreservoir Lakes)

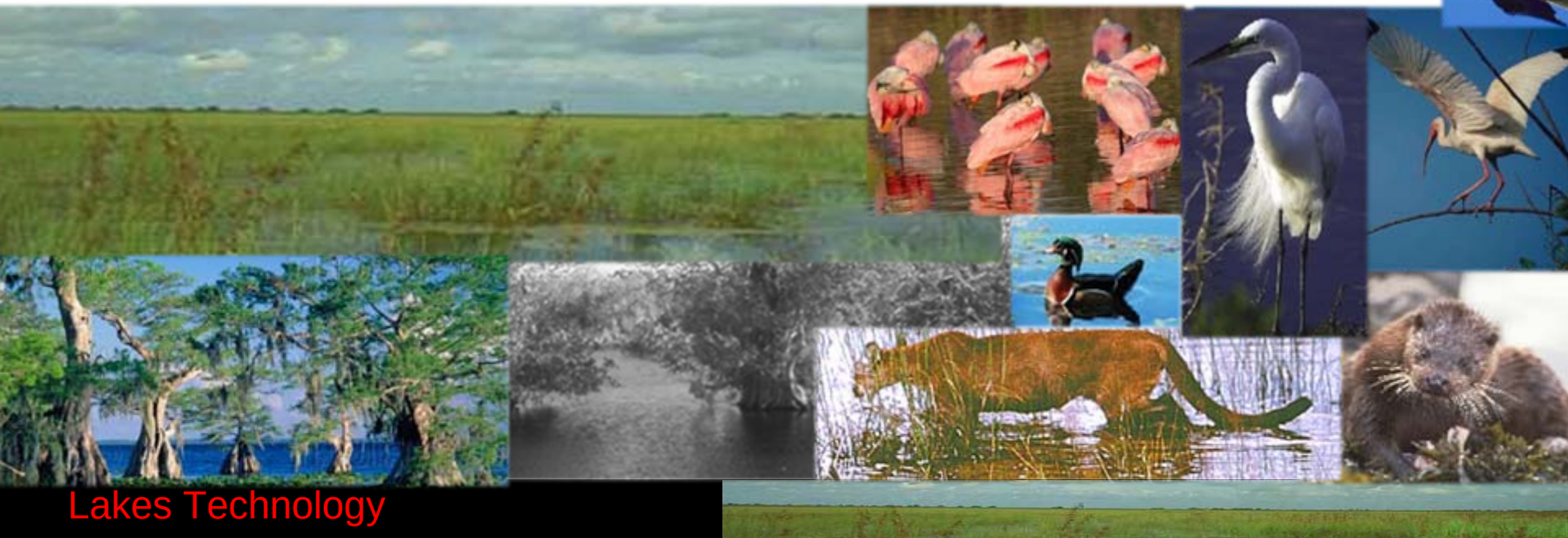
Prehistoric Fair Lawn Fish Weir, NJ (low cost Operations and Maintenance)

Suwannee River Big Shoals, FL (large flow rate capacity, boat passage on the sides)

Ecoreservoir (Lakes) Program (applied to USSC land)

Component: **Habitat Restoration**

1. **Lakes and Ecosloughs are 100% habitat restoration**
2. **All lakes have floodplain habitat**
3. **Threatened and Endangered species are positive**
   - Critically – Florida Panther – 160,000 ac minus lakes
   - Bald Eagle – 180,000 ac minus agricultural leases
4. **Native terrestrial and aquatic plant species are desired**



Lakes Technology

Ecoreservoir (Lakes) Program (applied to USSC land)

Component: **Habitat Restoration**

1. **4,240,000 MILLION FL Wildlife Watchers**
   - **$3 Billion spent in FL by Wildlife Watchers**
2. **2.7 MILLION FL Anglers**
   - **$1,536 Average spent per Angler**
   - **$4 Billion spent in FL by Anglers**
3. **236,000 FL Hunters**
   - **$377 Million spent in FL by Hunters**

U.S. Fish and Wildlife Service
H. Dale Hall,
Director

U.S. Department of the Interior
Dirk Kempthorne,
Secretary

U.S. Department of Commerce
Carlos M. Gutierrez,
Secretary

Economics and Statistics Administration
Cynthia A. Glassman,
Under Secretary for Economic Affairs

CENSUS BUREAU
H. Murdock,
Director

Activities in Florida by Residents and Nonresidents

Fishing	
Anglers	2,767,000
Days of fishing	46,311,000
Average days per angler	17
Total expenditures	$4,308,583,000
Trip-related	$1,973,985,000
Equipment and other	$2,334,598,000
Average per angler	$1,536
Average trip expenditure per day	$43
Hunting	
Hunters	236,000
Days of hunting	3,769,000
Average days per hunter	16
Total expenditures	$377,394,000
Trip-related	$155,116,000
Equipment and other	$222,278,000
Average per hunter	$1,442
Average trip expenditure per day	$41
Wildlife Watching	
Total wildlife-watching participants	4,240,000
Away-from-home participants	1,560,000
Around-the-home participants	3,274,000
Days of participation away from home	16,551,000
Average days of participation away from home	11
Total expenditures	$3,081,496,000
Trip-related	$887,942,000
Equipment and other	$2,193,554,000
Average per participant	$720
Average trip expenditure per day	$54

Activities in Florida by Nonresidents

Fishing	
Anglers	885,000
Days of fishing	4,804,000
Average days per angler	5
Total expenditures	$1,029,770,000
Trip-related	$653,894,000
Equipment and other	$375,876,000
Average per angler	$1,164
Average trip expenditure per day	$136
Hunting	
Hunters	22,000
Days of hunting	70,000
Average days per hunter	3
Total expenditures	$27,810,000
Trip-related	$22,889,000
Equipment and other	$4,921,000
Average per hunter	$1,256
Average trip expenditure per day	$327
Wildlife Watching	
Total wildlife-watching participants	746,000
Away-from-home participants	746,000
Around-the-home participants	(X)
Days of participation away from home	6,102,000
Average days of participation away from home	8
Total expenditures	$653,278,000
Trip-related	$632,953,000
Equipment and other	$20,325,000
Average per participant	$858
Average trip expenditure per day	$104

Lakes Technology

Ecoreservoir (Lakes) Program

Component: **Habitat Restoration**

The Congressional Sportsmen's Foundation and the National Assembly of Sportsmen's Caucuses report:

- **"Sportsmen - support more jobs in Florida than Disney World (85,000 jobs vs. 61,000)."**
- **"Annual spending by Florida sportsmen is more than twice the annual revenue of Miami-based Burger King ($4.8 billion vs. $2.05 billion)."**
- **"Annual spending by Florida anglers is more than three times greater than the cash receipts from the Florida's orange crop ($4.4 billion vs. $1.2 billion)."**
- **"A quarter of a million tourists with wildlife-watching plans travel to Florida each year, making Florida the No. 1 destination in the country for wildlife viewing."**

Planning:

Lakes Technology

Layout

Reserve

River of Grass Restoration Reserve

“…providing a multitude of benefits for the environment, lake communities, agriculture and for the general public”

We are planning and designing a unique
“Place” for people, for wildlife, for Florida

River of Grass Restoration Reserve

An American “Place”
In an American landscape

Building upon:
the Comprehensive Everglades Restoration “Plan”
and the Water Resources Development “Act”

Ecoreservoir (Lakes) Program (applied to USSC land)

A highly designed and engineered system with sensitive flow dynamics, and natural, and community design components:

- Engineers; Landscape Architects; Hydrogeologists; Ecological Sciences; Flow Modelers; Geotechnical; Surveyors; Economists; Public Participation; the Public and Others
- Construction Managers; Cost Estimators; Workforce Managers; and Others
- Scientific Peer Reviews; Monitoring; and Others

River *of* Grass Restoration Reserve

Benefits

1) **Ecoreservoir – Chain of lakes storage**

   A lower cost,100 mile ecological flowway with a multiuse chain of lakes within low natural landforms (similar to a low Okeechobee Ridge); littoral zones of cypress, pond apple and sawgrass; gravity flow; navigable; no levees;

2) **Ecosloughs – Hammocks, creeks, glades**

   Water quality component reflecting nature, replacing canals; cypress, pond apple and sawgrass; gravity flow; often navigable;

3) **Navigation and watercraft recreation**

   100 mile commercial and recreational channel within the lakes and creeks, connecting each city; motorized and paddlecraft;

4) **Agricultural lands**

   Agriculture lands leased to private companies consistent with Reserve goals and plan; providing continued community viability and identity.

River of Grass Restoration Reserve approach images (from other sources)

River *of* Grass Restoration Reserve

Benefits ...*Page 2, continued*

5) Wildlife and habitat

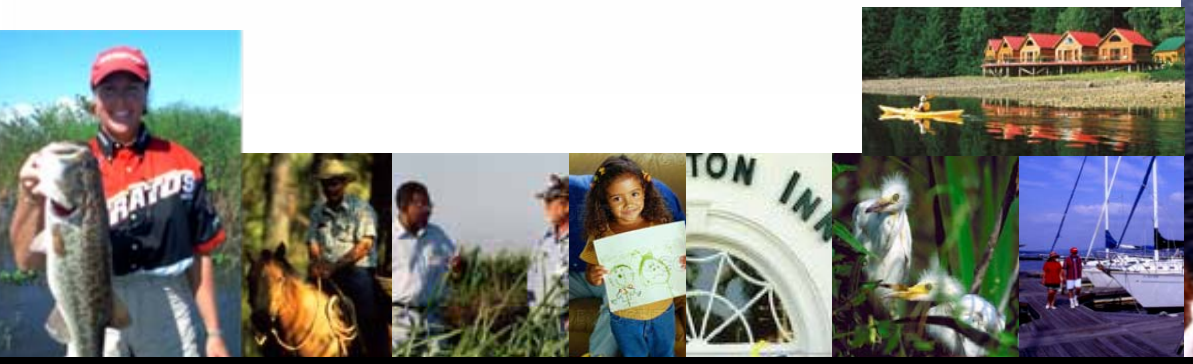
Cost savings; less maintenance; new habitat for Threatened and Endangered species; expanded populations, birding; increased support businesses;

6) Community waterfront places

Revenue and jobs from new development; some used for the upgrade of existing areas; more support businesses and a higher Quality of Life; Educational center interpreting the Reserve;

7) Nature-based commerce

Revenue and jobs from water and wildlife oriented development, more events and lodging, restaurant visits; increased support business.



Restoration Reserve approach images (from other sources)

Consistent with local governmental plans and economic development statements:

Palm Beach County: 2007, Commission accepted Strategic Economic Development Plan (Grand Canal System, greenways, blueways, trails, streetscapes for the development of the Glades Lake O. communities, within comprehensive planning process requirements; **also including land requests from the cities to the State)**

City of Clewiston Town Plan, 1925: (Waterfront development and town perimeter areas growth plan; partially constructed per plan prior to hurricanes; new development areas correspond generally with the historic plan)

Glades County: 2008, local goal to rehydrate historic Lake Hicpochee for economic purposes (Currently in the Northern Everglades Caloosahatchee River Watershed Protection Plan to the Florida Legislature; originally forwarded by Mr. Alvin Ward of Glades County; any new land usage is proposed to compensate the local public revenues)


Kissimmee River Restoration
▪"re-establish historic hydrologic conditions
▪ recreate the historical river/floodplain connectivity
▪ recreate the historic mosaic of wetland plant communities
▪ restore the historic biological diversity and functionality"
Canal-38 re-filled
"…to restore over 40 square miles of river and floodplain ecosystem including 43 miles of meandering river channel and 27,000 acres of wetlands."
The River of Grass Restoration Reserve
is similar to the popular Kissimmee River Restoration
Planning

Ecoreservoir Lakes Restoration Model:
Florida State Parks

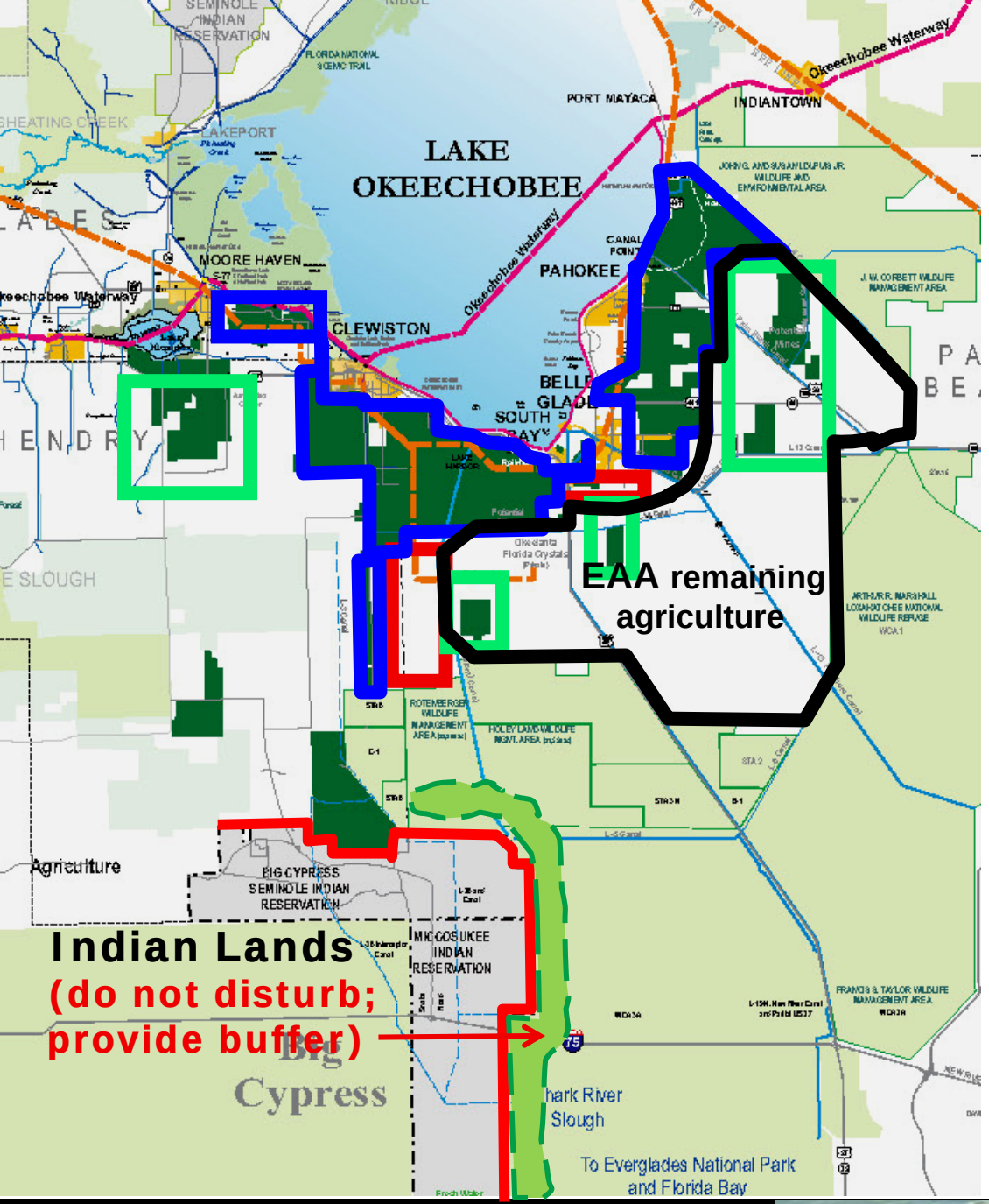
FDEP Images

Planning

Photo By Jasmine Marsden Contest
DeLeon Springs State Park

Photo By Lou Garofaltest
Edward Ball Wakulla Springs State Parl

Photo By Paul Strauss
Savannas Preserve State Park



US Sugar Corporation Lands

(Planned State of Florida purchase)

Dark Green: Existing US Sugar Corp property

Blue: flowway opportunities with care for viable cities

Red: gaps to fill in flowway

Green: excess land to trade for gaps (back to agriculture)

Black outline: Everglades Agricultural Area (EAA)

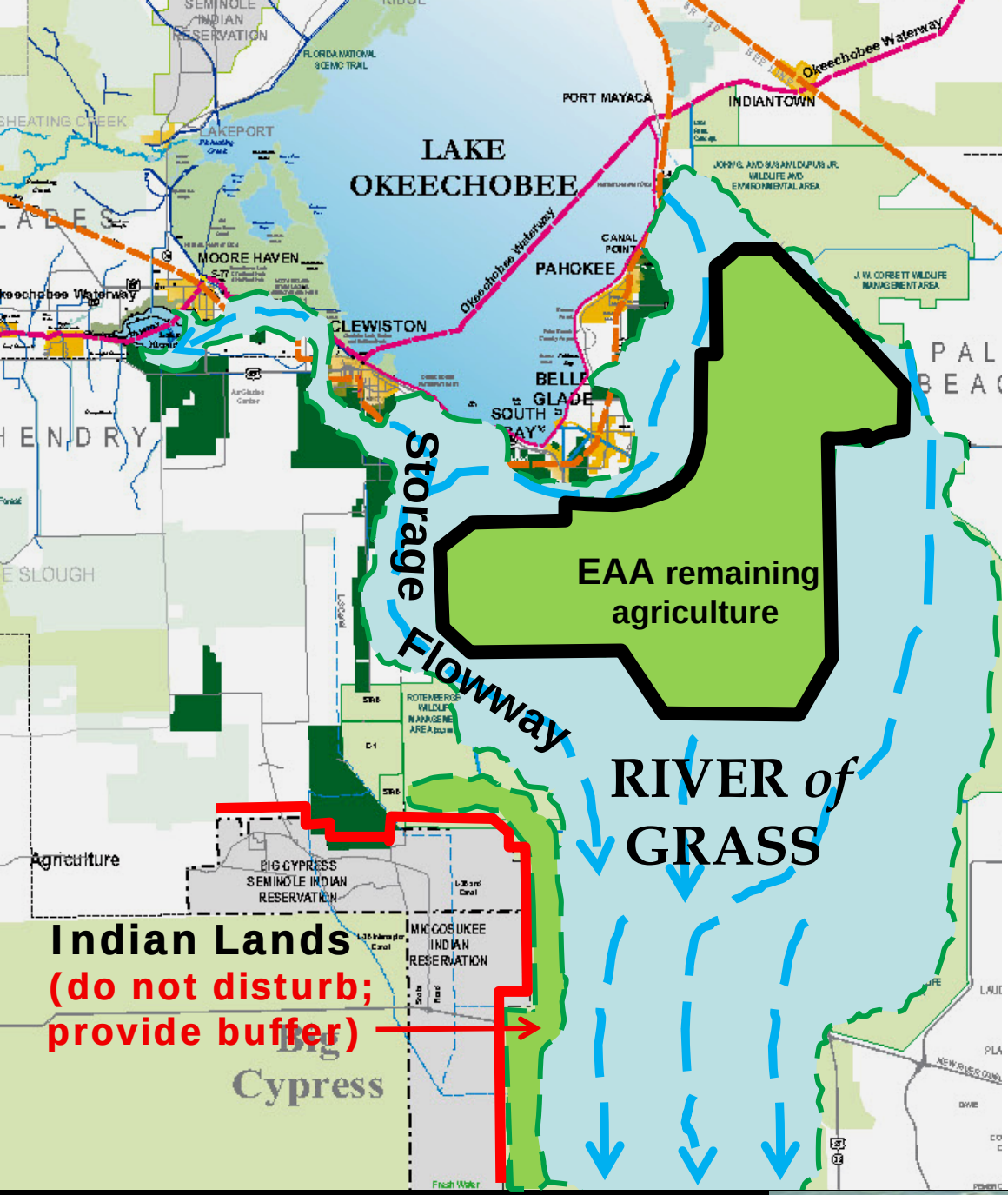
Note: it is feasible to use canals to connect if land is not available in gaps

USSC land

City areas (do not disturb)

All areas are approximate

Planning (early sketch)

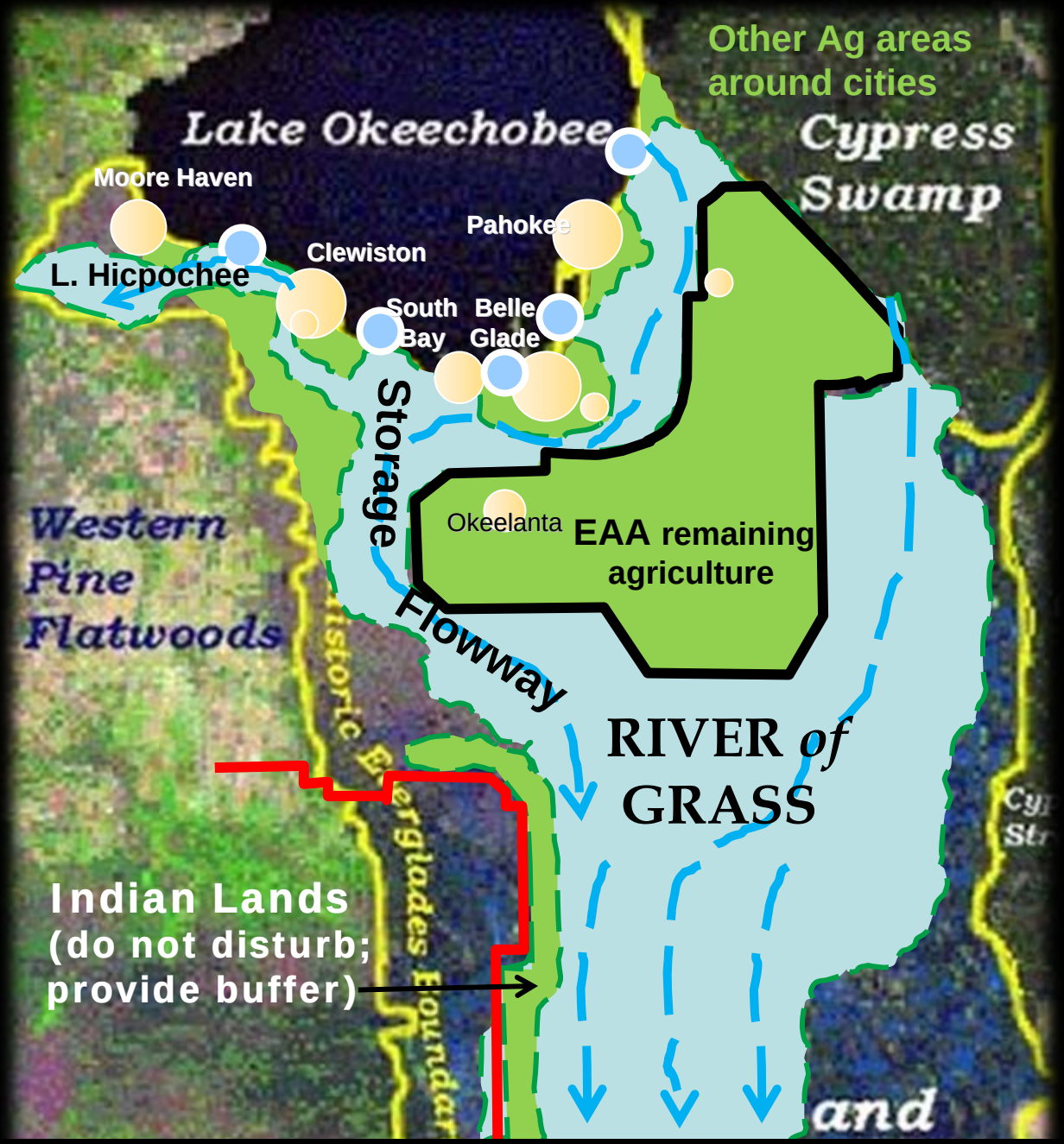


General Flow Diagram

River *of* Grass Restoration Reserve

- Continuous Flow -

Planning (early sketch)



General Flow Diagram

River *of* Grass Restoration Reserve

- Continuous Flow -

Re-establishes the historic River of Grass linkage (around the EAA)

Links cities and provides land for stormwater and managed compact growth; direct business access to the chain of lakes

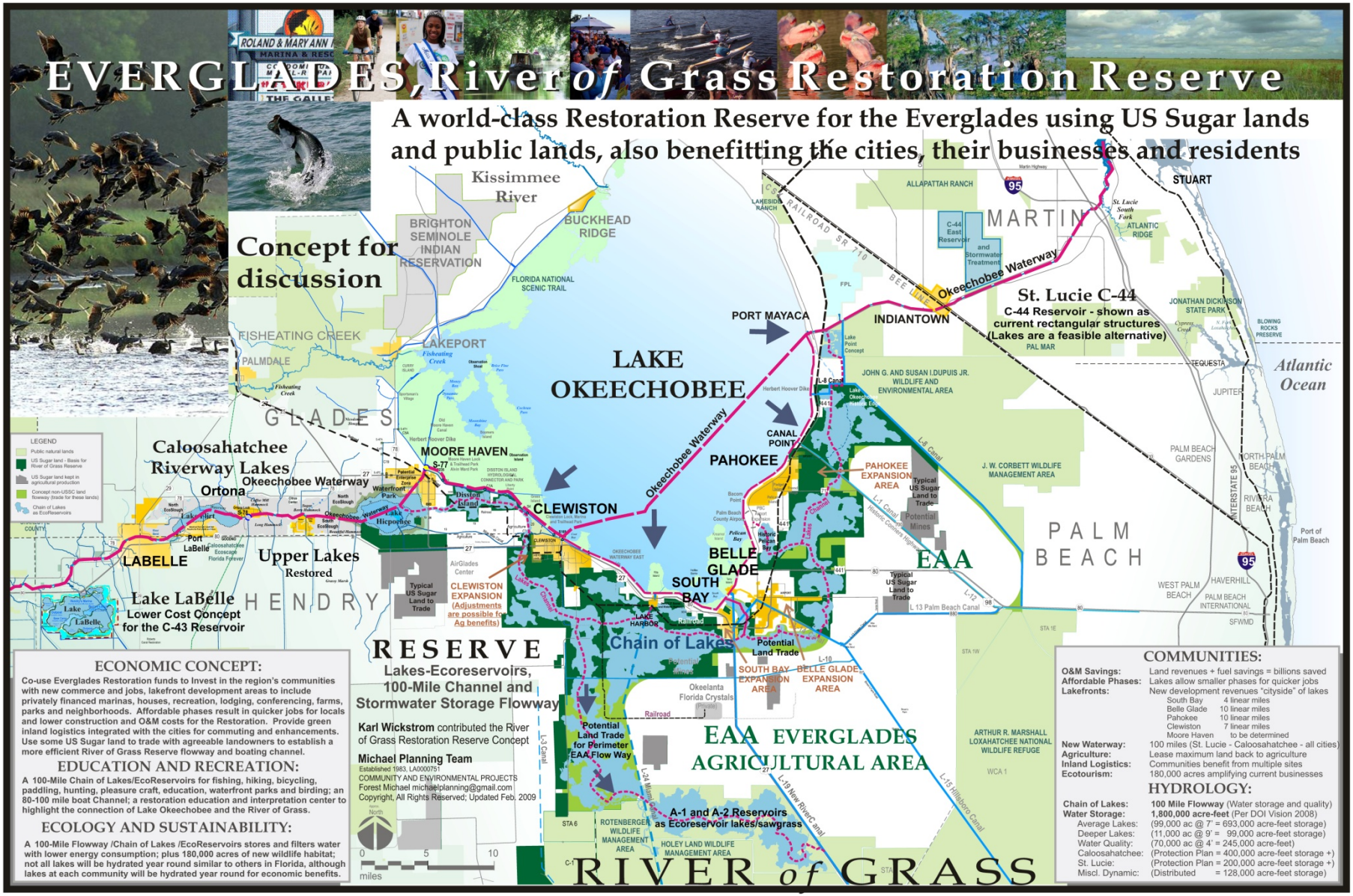
Controls seepage and flow - Ag, cities, Indians

Contiguous EAA lands

Buffers Indian's lands

Decompartmentalization per DOI - science vision

Planning (early sketch)



Concept sketch for discussion: includes city land asks to the State; represents areas where trades with current landowners other than US Sugar may be negotiated, if landowners are willing; does not represent "takings" and is a sketch.

Planning (early sketch)

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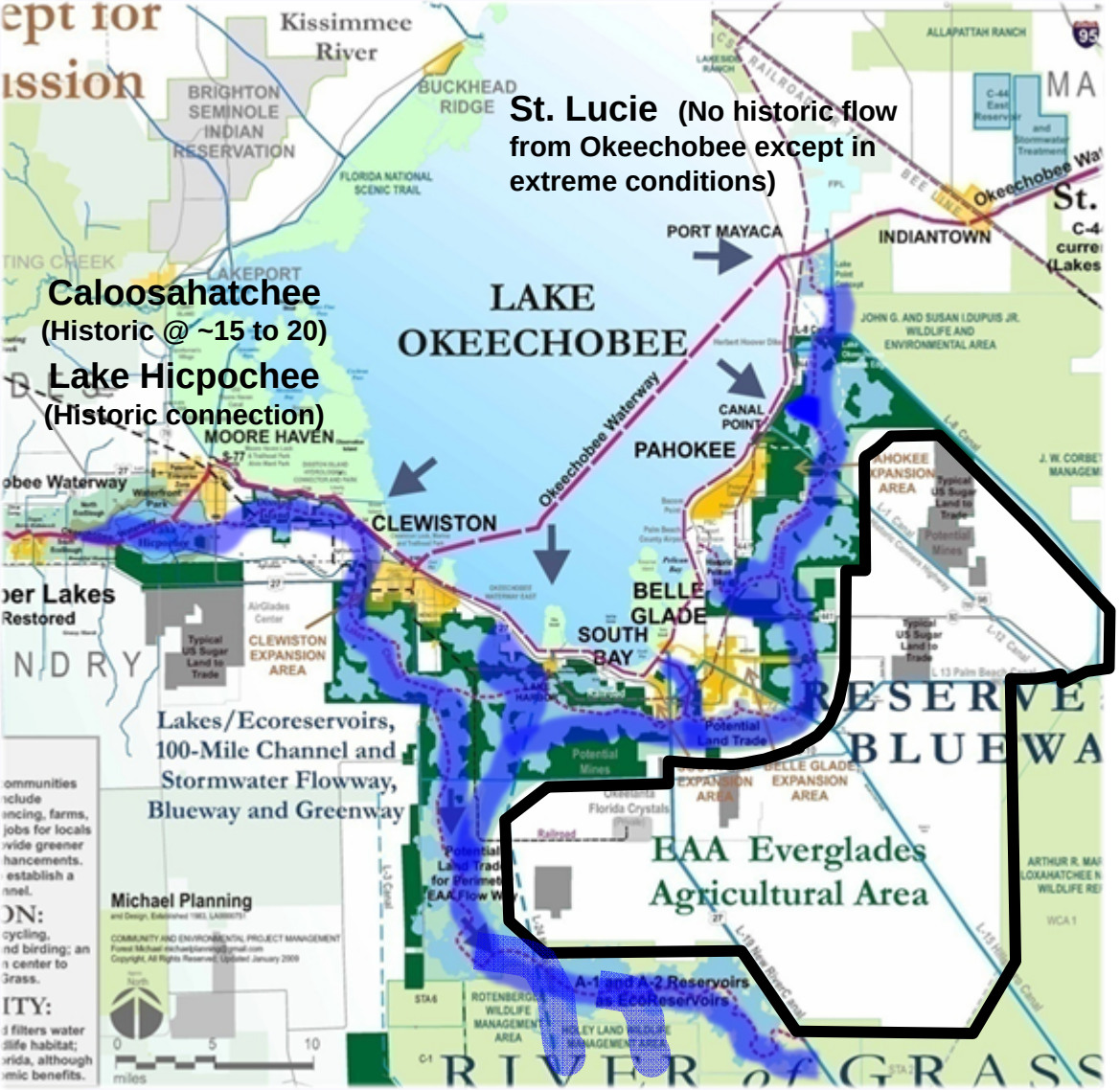

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Links cities and provides land for stormwater and managed compact growth

Controls seepage and flow - Ag, cities, Indians

Contiguous EAA lands

Buffers Indian's lands

Decompartmentalization per DOI - science vision

Concept sketch for discussion: includes city land asks to the State; represents areas where trades with current landowners other than US Sugar may be negotiated, if landowners are willing; does not represent "takings" and is a sketch.

Good planning and design: results in *"the greatest benefit for the greatest number"*

Multiuse Benefits: Ecology and Water Management

Restore River of Grass –	**~165,000 acres** min. ecology and the USDOI and science envisioned decompartmentalization-DECOMP areas extending south to ENP;
Historic Flowway –	**~100 miles for water quality**, flood protection and recreation;
Storage and Quality –	**~1,000,000 (plus) acre-feet of storage** in the Reserve system;
E. and W. Estuaries –	**Substantial relief for the Caloosahatchee and St. Lucie;**
Flood Control Safety –	**Wider flowways relieve Lake Okeechobee** and potential Dike breaches;
Energy Savings –	**Substantially less energy used** to pump; low carbon;
Gravity Flow –	Restore ROG Flow; manage fewer structures and pumps;
Water Supply –	Supply for the cities, agriculture, Florida Bay (analysis required);
Replenish Groundwater –	More than half of Glades water has been lost;

Multiuse Benefits: Economic and Community

New Construction Jobs –	**Jobs building the more affordable phases;**
New Support Jobs –	**New development jobs** from Everglades-based development;
Community-Ag Jobs –	**~15,000 acres to the cities** for economic purposes;
Development Revenue –	**New revenue to cities** from lakefront developments;
Lower Costs /Savings –	**Lower facility costs** due to less infrastructure and O&M;
Waterfront Development –	**~ 30-miles of land for development,** marinas and parks;
Inland Port(s) –	**Accommodation of concept for local jobs** and prosperity;
Ecotourism –	**Lodging, conferencing, fishing, birding, trails, paddling;**
Lakes Waterway (Grand Canal)	**~100-mile channel connecting cities** for commercial and residents;
River of Grass Reserve –	Regional-scaled park for residents, businesses, visitors;
Educational Center –	Interpretive Educational Center for the Upper Everglades;

(**~ means approximate;** all calculations are approximate in this sketch phase)

Planning:

Lakes Technology

Layout

Reserve

...an overview

“Restoration Reserves”

A traditional and sustainable approach to land and water management
(Comprehensive Management Plans address all intrinsic resources, operations, management and capital programs, funding and public participation).

Guana Restoration Reserve, FL
http://www.gtmnerr.org/
(FDEP, FL State Parks, SJRWMD, NOAA; *Positive Florida model)*

Pinelands National Reserve, NJ
http://www.nps.gov/pine/
(Pinelands Commission, NPS, others; *Positive national model)*

Wisconsin Arboretum
http://uwarboretum.org/
(Aldo Leopold; Univ. of Wisconsin; *Positive national historical model*)

Example:
The Guana Reserve

The Guana Tolomato Matanzas National Estuarine Research Reserve encompasses approximately **55,000 acres** of salt marsh and mangrove tidal wetlands, oyster bars, estuarine lagoons, upland habitat and offshore seas in Northeast Florida. It contains the northern most extent of mangrove habitat on the east coast of the United States.

Guana Restoration Reserve images (from other sources)

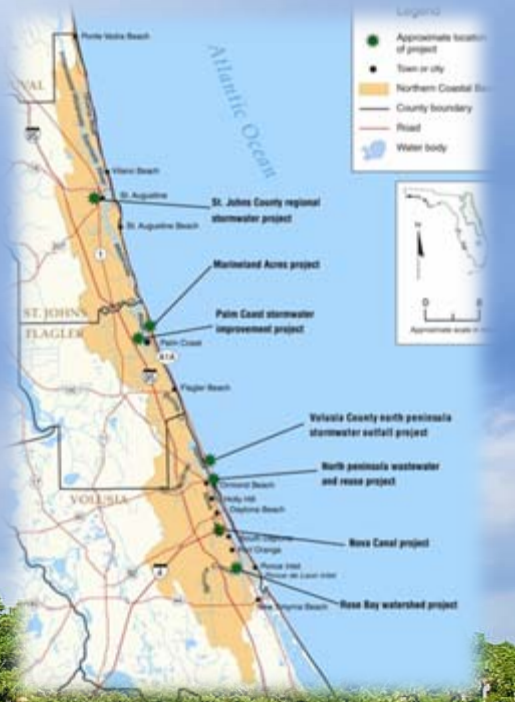
Example:

Northern Coastal Basin

Fiscal Year 2009 – 2010

St. Johns River Water Management District

Including the Guana Reserve



Reserve

Example:

Pinelands National Reserve

40 million pounds of cranberries

Reserve

Example:

Pinelands National Reserve, NJ, **1.1 million acres** including portions of seven counties and all or parts of 56 municipalities. …It is the largest body of open space on the Mid-Atlantic seaboard between Richmond and Boston and is underlain by aquifers containing 17 trillion gallons of some of the purest water in the land.

…ecotourism with highly productive agribusiness.

Pineland National Reserve images (from other sources)

Reserve

Everglades Agriculture! Belle Glade, Clewiston, LaBelle, Moore Haven, Pahokee, South Bay …

- **Slower transition of USSC;**
- **Keep some Ag land** – can some storage be moved north to Kissimmee?
- Keep Ag's "image" – "The Sweetest…" more Ag events, tours (Farmers Market, etc.)








Reserve

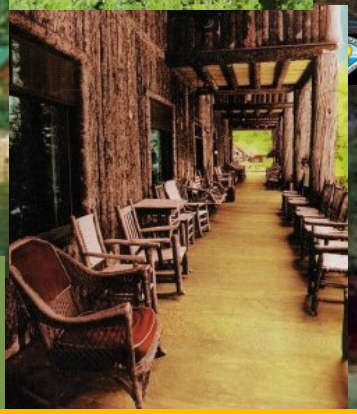
Lake O based – Amplify current marina / tours / events birding, boating, fishing, trails…

Reserve

New regattas: contestants and audiences, lodging, restaurants…

CLEWISTON INN

Reserve



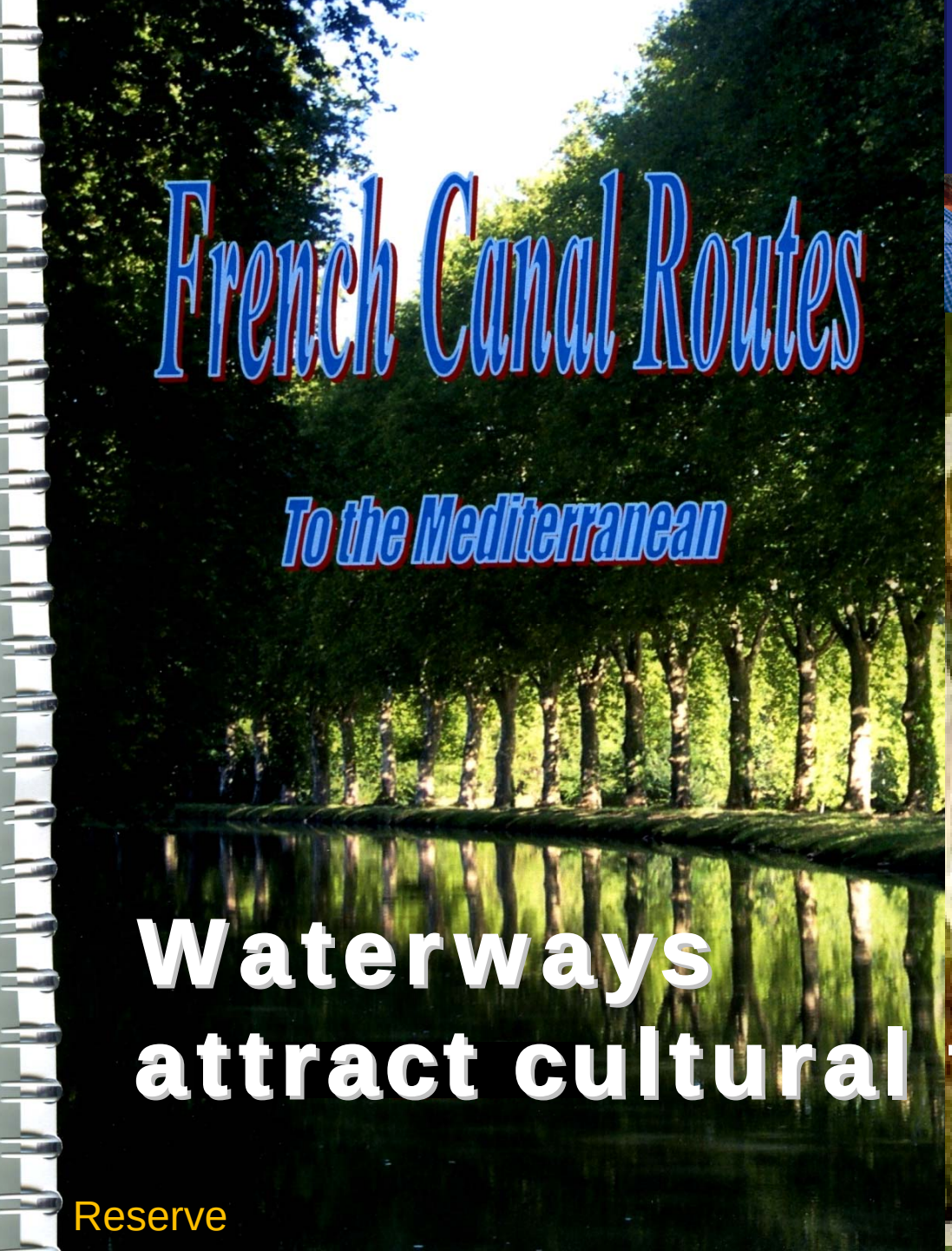
Women's Environmental Institute at Amador Hill

CENTER FOR CULTURAL & ECO-TOURISM

UNIVERSITY of LOUISIANA Lafayette

Reserve

Conferencing and Lodging



Waterways attract cultural tourism

Reserve

Waterways are prominent in Palm Beach County's Economic Plan

Reserve


Reserve

Bicycling and pedestrian trails, for work and pleasure!

L.O.S.T expanded

Reserve

Dr. Bruce Stephenson and
Professor David Schuyler

Boston’s Historic Emerald Necklace

(Urban and regional stormwater system example)

Reserve

A “comprehensive approach”
to the US Sugar lands:

River *of* Grass Restoration Reserve

“…providing a multitude of benefits for the environment, lake communities, agriculture and for the general public”

1 Million Ac-Ft & WQ **+** **Nature** **+** **Cities and Agriculture**

Questions

River *of* Grass Restoration Reserve

Karl Wickstrom and Forest Michael

Please send any written comments to:
michaelplanning@gmail.com

River of Grass Restoration Reserve approach images (from other sources)