Identification of Problems, Objectives and Constraints for River of Grass Phase I Planning Process

An initial step in the River of Grass Phase I Planning Process is to identify problems, objectives and constraints that should be considered. These problems, objectives, and constraints should be consistent with the following Vision and Goal Statements. The table below will be used to compile the problems, objectives, and constraints into four main geographic regions that will likely be affected by the project or projects associated with this land acquisition:

- Lake Okeechobee Watershed
- Northern Estuaries
- Everglades Agricultural Area
- Everglades and Florida Bay

Once compiled, the information in the table will be sorted into the following groups:

- Areas that can be covered in this initial planning effort
- Areas that may be covered in this initial planning effort
- Areas that will be dealt with in future planning phases
- Areas that may be common to other ongoing planning efforts
- Areas that are inconsistent with the River of Grass Vision Statement and Goals
- Areas needing clarification

Vision:
Maximize restoration opportunities for the South Florida ecosystem by acquiring strategically located lands, establishing a managed system of water storage and treatment, and restoring a historic hydrologic connection to benefit America's Everglades, Lake Okeechobee, and the St. Lucie and Caloosahatchee rivers and estuaries.

Goals

- Increase the availability of water storage to reduce harmful freshwater discharges from Lake Okeechobee to Florida's coastal rivers and estuaries and to redistribute more water to the south to restore the southern Everglades.
- Increase the availability of storage and treatment to enhance the delivery of cleaner water to the Everglades.
- Prevent harmful phosphorus flows from entering Lake Okeechobee and the Everglades.
- Eliminate the need for "back-pumping" water into Lake Okeechobee.
- Improve the U.S. Army Corps of Engineers' options for managing Lake Okeechobee within a more desirable ecological range.
- Provide additional water storage alternatives to relieve some pressures on the Herbert Hoover Dike while continuing to pursue timely rehabilitation.
- Support continued regional agriculture, as well as economic diversification, where viable.

Phase I Scope
Determine the range and general location of acreage needed north of the Everglades Protection Area for storing, treating and delivering the water flows needed to restore the Everglades, while enhancing ecological values in Lake Okeechobee and the northern estuaries.

	Problems	Objectives	Constraints
Lake Okeechobee Watershed	**Areas that can be covered in this initial planning effort**		
	• Undesirable high and low levels in Lake Okeechobee for ecological purposes • Land uses north of Lake Okeechobee rapidly affect discharge of stormwater to Lake Okeechobee • Water storage north of Lake Okeechobee limited • Backpumping (poor water quality) • Duration of extreme levels • Rapid rates of change of water levels • Conveyance constraints for discharge from Lake Okeechobee • Water quality from Lake Okeechobee	• Manage Lake Okeechobee within ecologically desirable ranges • Meet the Lake Okeechobee phosphorus Total Maximum Daily Load (TMDL) • Water supply for down steam users • Restore linkage from lake to everglades to achieve Quantity, Quality, Timing, Distribution (QQTD) for Everglades • Provide Everglades restoration flows • Increase availability of water supply in the Lake Okeechobee Service Area	• Water Quality Standards • Maintain tribal water supply • Economics to local communities • Maintain navigation • Provide Kissimee River restoration flows • Avoid adverse impacts to urban and agricultural legal water users in the Lake Okeechobee Service Area
	Areas that may be covered in this initial planning effort		
	• Muck accumulation in Lake associated with inflow from the north • Endangered species-mgmt of littoral zones • Loss of efficient storage in lake • Drought affecting ecotourism	• Meet minimum flows and levels • Recreation consistent with other water management objectives • Water quality treatment north of Lake Okeechobee • Increase storage capacity north and south of the lake • Increase water quality treatment north and south of the lake • Water to support ecological	• Maintain ecological compatibility with regional plans • High quality habitat north of Lake Okeechobee

		health of the lake • Provide management linkages between Lake Okeechobee and the northern estuaries and the south • Protect and enhance wildlife habitat • Enhance recreational opportunities	
	Areas that will be dealt with in future planning phases		
		• Flood protection for region • Develop an operational schedule that supports organisimal life cycles • Consider structure designs that are more ecologically friendly	• Maintain existing levels of service for flood protection • Available land (willing sellers) • Endangered species management (ESA)
	Areas that may be common to other ongoing planning efforts		
	• Excessive phosphorous loads to Lake Okeechobee • Water quality issues in Lake Okeechobee • Limited water quality treatment north of Lake Okeechobee • Excessive nutrients and pollutants • Exotic species • Excessive sediment in Lake Okeechobee • Herbert Hoover Dike integrity/risk of breach • Conversion of urban land leading to habitat loss • Improvements to fisheries needed • Other input (e.g. nitrogen bacteria)	• Remove pollution in the lake • Remove excessive muck accumulation from Lake Okeechobee • Reduce in-lake phosphorus loads • Accelerate Herbert Hoover dike repair • Best Management Practices (BMPs) need to be mandatory • Plant more vegetation to remove nutrients and stabilize bottom	• Herbert Hoover Dike integrity • Financial ability to implement large scale facilities • Feasibility of muck removal from Lake Okeechobee • Public funds availability • Maintain the characteristics of Fisheating Creek.

	Areas that are inconsistent with the River of Grass Vision Statement and Goals		
	Needs Clarification		
	• Excessive nitrogen in Lake Okeechobee as related to backpumping • Lake is being used to store and treat runoff from north shore basins		• $ and technology

	Problems	Objectives	Constraints
Northern Estuaries	**Areas that can be covered in this initial planning effort**		
	St. Lucie • Flows from Lake Okeechobee watershed leading to excess freshwater discharges from Lake Okeechobee resulting in undesirable low salinity conditions, muck accumulation and pollutants **Caloosahatchee** • Flows from Lake Okeechobee watershed leading toexcess freshwater discharges from Lake Okeechobee resulting in undesirable low salinity conditions • Excess freshwater discharges from basins north of Lake Okeechobee leading to an undesirable low salinity condition	**St. Lucie** • Eliminate the frequency and duration of excess freshwater discharges to the St. Lucie Estuary from Lake Okeechobee • Increase availability of water supply in the Lake Okeechobee Service Area **Caloosahatchee** • Eliminate the frequency and duration of excess freshwater discharges to the Caloosahatchee Estuary from Lake Okeechobee • Increase availability of water supply in the Lake Okeechobee Service Area	**St. Lucie** • Avoid adverse impacts to existing urban and agricultural legal water users in the Lake Okeechobee Service Area • Maintain navigation **Caloosahatchee** • Avoid adverse impacts to existing urban and agricultural legal water users in the Lake Okeechobee Service Area • Maintain navigation
	Areas that may be covered in this initial planning effort		
	St. Lucie • Excess nutrient loads from Lake Okeechobee leading to algae blooms, fish kills and mollusk and sea grass kills **Caloosahatchee** • Excess nutrient loads from Lake Okeechobee leading to algae blooms and fish kills • High salinity conditions due to insufficient flows	**St. Lucie** • Reduce nutrient loading from Lake Okeechobee to help achieve nutrient Total Maximum Daily Loads (TMDLs) once adopted **Caloosahatchee** • Achieve minimum flows and levels (MFL)	**St. Lucie** • Economic impacts **Caloosahatchee** • Economic Impacts

	Areas that will be dealt with in future planning phases		
	St. Lucie • Destruction of sea grass beds resulting from excess Lake Okeechobee discharges(benthic communities) **Caloosahatchee** • Destruction of sea grass beds resulting from excess Lake Okeechobee discharges (benthic communities)	**St. Lucie** • Provide pulse release recovery periods **Caloosahatchee** • Provide pulse release recovery periods	**St. Lucie** • Maintain existing levels of service for flood protection • Water Quality Standards • Modeling for biological indicators • Permitting **Caloosahatchee** • Maintain existing levels of flood protection • Modeling for biological indicators • Permitting • Water Quality Standards
	Areas that may be common to other ongoing planning efforts		
	St. Lucie • Excess local watershed runoff leading to an undesirable low salinity condition, muck accumulation - pollutants **Caloosahatchee** • Excess local watershed runoff leading to undesirable low salinity condition - muck • Loss of wetlands and natural storage	**St. Lucie** • Manage the frequency and duration of excess freshwater discharges to the St. Lucie Estuary from the St. Lucie River Watershed • Remove existing muck in estuary • Build C-44 (Implement IRL South) • Restoration of benthic communities • Reduce nutrient loading; achieve nutrient TMDLs once adopted (basin) • Recapture some of lost natural storage	**St. Lucie** • Funding availability • Elimination of TMDL Funds • Herbert Hoover Dike integrity **Caloosahatchee** • Funding availability • Elimination of TMDL Funds • Herbert Hoover Dike integrity

		• Implement Northern Everglades plans **Caloosahatchee** • Reduce the frequency and duration of excess freshwater discharges to the Caloosahatchee Estuary from the Caloosahatchee Watershed • Build C-43 • Reduce nutrient loading; achieve nutrient TMDLs once adopted (basin) • Restoration of benthic communities • Recapture some of lost natural storage • Implement Northern Everglades plans	
	Areas that are inconsistent with the River of Grass Vision Statement and Goals		
	Needs clarification		
	St. Lucie • Phosphorus is the predominant nutrient of concern **Caloosahatchee** • Nitrogen is the predominant nutrient of concern • Lack of economic alternatives – impacts to tourism and fishing industries		• Land availability • Extreme rain events

	Problems	Objectives	Constraints
EAA and Western Basins	**Areas that can be covered in this initial planning effort**		
	• Soil subsidence • Loss of natural hydrology • Nutrient enriched Lake Okeechobee water overloads Stormwater Treatment Areas (STAs) • Inadequate water supply during low Lake Okeechobee levels • Lack storage and treatment • Excess phosphorus export to natural systems • Rock mining • Land use changes • Lack of conveyance through the Everglades Agricultural Areas (EAA) impacts estuaries • Clean up and remediation of contaminated properties	• Minimize impacts to landowners • Use land where depth of soil is no longer desirable • Meet water quality standards sufficient to eliminate impact to the natural system • Reduce runoff-related phosphorus concentrations and loadings • Increase availability of water supply in the Lake Okeechobee Service Area	• Minimize economic impacts on land owners and communities • Contiguous land • Environmental contamination • Rock mining • Avoid adverse impacts to urban and agricultural legal water users in the Lake Okeechobee Service Area
	Areas that may be covered in this initial planning effort		
	• Loss of jobs/communities • Implementation without addressing agricultural sustainability • Loss of land base to meet objectives downstream • Remove: Loss of natural hydrology	• Economic sustainability for Glades communities through economic diversification • Define and maintain agricultural sustainability • Restore natural hydrology to the systems that depend on the EAA for water • Increase local communities stormwater management capabilities • Increase agro-tourism and	

		ecotourism business	
	Areas that will be dealt with in future planning phases		
	• Water supply to C-139	• Increase wildlife habitat	• Maintain existing levels of service for flood protection • Land - willing seller • Willingness of other property owners to get right footprint
	Areas that may be common to other ongoing planning efforts		
	• Exotic species	• Nutrient loads to Lake Okeechobee need to meet TMDL's • Provide adequate treatment to meet EAA needs	• Funding availability
	Areas that are inconsistent with the River of Grass Vision Statement and Goals		
	• Increased mining	•	• Economic effects of increased regulation
	Needs clarification		
		• Minimize impacts of landowners and population • Increase agricultural communities participation in re-vegetating the river of grass	• Proposed land use changes (non-agriculture, non-restoration) • Population???

	Problems	Objectives	Constraints
Everglades and Florida Bay	**Areas that can be covered in this initial planning effort**		
	• Reduction in total volume delivered to the Everglades Protection Area • Excessive phosphorus loading and concentrations • Excessively high and low salinities in Florida Bay • Connectivity with the regional system • Flashiness-rapid up and downs	• Increase dry season and dry years flows and levels • Increase total flows to Everglades Protection Area/ Southern Estuaries • Reduce the phosphorus concentration and loading to the Everglades Protection Area • Eliminate peat fires/maintain soil formation	• Avoid impacts to Tribal communities • Water Quality Standards
	Areas that may be covered in this initial planning effort		
	• Excessively high nitrogen and low salinities in Florida Bay • Flushing water-circulation • Excessive phosphorus loading and concentrations of nitrogen • Excessively high and low salinities in Florida Bay/Biscayne Bay	• Achievement of restoration ecological goals/benefits	
	Areas that will be dealt with in future planning phases		
	• Loss of natural hydropatterns and hydroperiods • Loss of ridge and slough landscape • Impacts to tree islands • Increased frequency of muck fires • Endangered species • High and low levels in WCA3 • Loss of habitat • Managing central Everglades as impoundments	• Increase total flows to Southern Estuaries • Manage flows to restore more natural salinity regime in Florida Bay • Restore natural hydrology where possible • Minimum flows and levels	• Land constraints • Local flood control • East coast urban (flood protection) • Minimize/avoid impacts to threatened and endangered species

	Areas that may be common to other ongoing planning efforts		
	• Resolve Modified Water Deliveries project • Exotic and invasive species • Seepage losses • Sea level rise • Tamiami Trail • Sprawling development impacting Everglades and Florida Bay (UDB) • Flood mitigation for surrounding urban area	• Manage flows to restore more natural salinity regime in Biscayne • Decomp • Seepage Management • Create management linkages between WCA 2&3 • Enhance recreational opportunities • Utilize land and water management to control invasive species/exotic species • Support CERP enhancement projects • Improve scenic qualities • Limit urban sprawl/maintain Urban Development Boundary (UDB)	• Inability to get water to Biscayne Bay • Single species management • Volume of allowable flow to Everglades National Park (Tamiami Trail) • Seepage management • Loss of spatial extent
	Areas that are inconsistent with the River of Grass Vision Statement and Goals		
			• Funding
	Needs Clarification		
	• Incompatible goals • Toilets-Keys • Lack of local buy-in • Legal roadblocks	• Connect Greater Everglades with regional system • Sewer system • Increase stakeholder involvement	• Legal constraints • Compatible ecological objectives throughout the system

Parking Lot	• Exotic Species control • Re-evaluate Lake Okeechobee TMDL • Modify schedules of Upper Kissimmee Chain of Lakes • Take advantage of willing partners and seller north and south • Transition Plans for local communities • Better incentives for agriculture including BMPs and payments for environmental type services • Biscayne Bay – why not included • Big Cypress Basin – why not included • Construct C-43 West Reservoir and C-44 • Problem – structural integrity of Herbert Hoover Dike • "Muck" and various definitions especially from region to region • Uncontrolled growth in Lake Kissimmee area • Overarching constraints • Adequate conveyance from Lake Okeechobee to the Everglades • Tribal representation • Water quality issues related to high nutrients (from Lake Okeechobee) • Water deliveries from the Lake to southern Glades (infrastructure limitations) • Distribution of flow to greater Everglades, Water Conservation Areas and Everglades National Park • Lack of storage and treatment • Storage north of Lake Okeechobee