



The Governor's Commission for a  
**Sustainable South Florida**

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LT. GOVERNOR

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BONNIE KRANZER  
EXECUTIVE DIRECTOR

GREG DIEHL  
DEPUTY DIRECTOR

July 27, 1998

The Honorable Lawton Chiles  
Governor, State of Florida  
The Capitol, Room 1501  
Tallahassee, Florida 32399-0001

Dear Governor Chiles:

The "Restudy" of the C&SF Project began in 1992 following its authorization by the Water Resources Act of 1992. Since that time, a reconnaissance report was completed in November 1994, and the Corps of Engineers (Corps) and the South Florida Water Management District (SFWMD) are now nearing completion of a Draft Comprehensive Plan. This plan is due for public release in October 1998, with final submittal to Congress on July 1, 1999. This latter effort began in September 1997, and consisted of a series of alternative evaluations for the C&SF Project, attempting to maximize water resource benefits for South Florida's environment, economy and citizenry and its national and international assets.

In March of 1998, the Governor's Commission for a Sustainable South Florida began an intensive four month assessment of the Restudy process and products for the expressed purpose of providing broad based recommendations and comments to you and the Lieutenant Governor, the Corps of Engineers, the Governing Board of the SFWMD and the South Florida Ecosystem Restoration Task Force (Task Force) prior to the Comprehensive Plan's initial release. The intent of this interim assessment was to identify and discuss issues of concerns from stakeholders, and ultimately craft a consensus-based set of recommendations to improve the Restudy review process and ultimate outcome of the Restudy efforts. At the same time, the Commission endeavored to determine if the key components of the Restudy's analysis, as presented to the Commission to date, are generally consistent with the Commission's Conceptual Plan (endorsed and approved, respectively by the Governing Board of the SFWMD and Governor Lawton Chiles in the fall of 1996).

At this time, I am pleased to provide you with the following *Interim Report on the C&SF Project Restudy*, unanimously adopted by the Governor's Commission on July 24, 1998. In a display of great patience, understanding and mutual respect, the Commission members demonstrated their commitment to finding mutual solutions for the benefit of the South

Florida ecosystem by painstakingly reviewing, revising and agreeing to the 33 recommendations hereby enclosed. The Commission also unanimously agreed that the key components of the Restudy, thus far, are generally consistent with the Governor's Commission Conceptual Plan.

I am also transmitting to you a set of recommendations unanimously approved by the Commission on July 24, 1998 that pertain to expediting the implementation of the Modified Water Deliveries Project. This project is essential to the restoration and preservation of the Florida Everglades. A related Commission resolution (adopted July 24, 1998), requesting timely acquisition of more precise contour topographical data for South Miami-Dade County, is also enclosed. Rapid development of this information is essential in aiding the hydrologic modeling necessary for Everglades restoration and the implementation of projects such as the Modified Water Deliveries Project, the C-111 Project and other restoration projects while assuring a sustainable agricultural economy in South Miami-Dade County.

This simultaneous transmittal of recommendations to you and the Lieutenant Governor, the Corps, the SFWMD, and the Task Force, is the first in a series of periodic assessments intended to ensure that a full range of opportunities for stakeholder and citizen input and feedback are conveyed and utilized in the development of the Comprehensive Plan for the Restudy. The Commission intends to provide subsequent input to the Restudy process, particularly after the draft October Comprehensive Plan is released. At that time, the Commission will endeavor to elaborate on critical issues yet unresolved, such as water assurances for the natural and built system, and convey these and any additional stakeholder and interest group concerns to the appropriate governmental entities. The Commission will continue to serve as the advisory body to the Task Force by providing a forum for public input, dialogue and consideration of these Restudy issues throughout the development and authorization process.

The Governor's Commission for a Sustainable South Florida has been dedicated to its mission since its inception in March of 1994. Throughout these years and numerous reports, the Commission has been determined to chart a course for South Florida that improves its natural assets, while continuing to provide for its diverse economy and citizenry. This *Interim Report on the C&SF Project Restudy* and additional recommendations on enhancing and expediting restoration related projects in South Miami-Dade County follow this course as they attempt to better guide and negotiate the difficult future that South Florida faces. We expect that these recommendations, if adopted, will help us attain that preferred future of a sustainable South Florida. We have advised the Task Force that our release of these recommendations to it is subject to your comments and directions to the Commission and that the Task Force will be appraised of your response when issued.

Sincerely,



Richard A. Pettigrew  
Chairman

Attachments

cc: Commission Members  
Col. Joe Miller, U.S. Army Corps of Engineers  
Task Force Members  
Rock Salt, Ex. Dir, Task Force  
Governing Board Members, SFWMD  
Debbie Skelton, Florida Coastal Zone Mgmt. Program  
Sam Poole, Ex. Dir., SFWMD  
Working Group Members  
Mollie Palmer, Special Assistant, DEP  
Estus Whitfield  
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Janice Fleischer, Fl. CRC





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DEPUTY DIRECTOR

July 27, 1998

The Honorable Buddy MacKay  
Lieutenant Governor, State of Florida  
The Capitol, Room PL-05  
Tallahassee, Florida 32399-0001

Dear Lt. Governor MacKay:

The "Restudy" of the C&SF Project began in 1992 following its authorization by the Water Resources Act of 1992. Since that time, a reconnaissance report was completed in November 1994, and the Corps of Engineers (Corps) and the South Florida Water Management District (SFWMD) are now nearing completion of a Draft Comprehensive Plan. This plan is due for public release in October 1998, with final submittal to Congress on July 1, 1999. This latter effort began in September 1997, and consisted of a series of alternative evaluations for the C&SF Project, attempting to maximize water resource benefits for South Florida's environment, economy and citizenry and its national and international assets.

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Sincerely,



Richard A. Pettigrew  
Chairman

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Task Force Members  
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BONNIE KRANZER  
EXECUTIVE DIRECTOR

GREG DIEHL  
DEPUTY DIRECTOR

July 27, 1998

Patricia J. Beneke  
Assistant Secretary for Water and Science  
U.S. Department of the Interior  
1849 C. Street, NW, Room 6660  
Washington, D.C. 20240

Dear Assistant Secretary Beneke:

The "Restudy" of the C&SF Project began in 1992 following its authorization by the Water Resources Act of 1992. Since that time, a reconnaissance report was completed in November 1994, and the Corps of Engineers (Corps) and the South Florida Water Management District (SFWMD) are now nearing completion of a Draft Comprehensive Plan. This plan is due for public release in October 1998, with final submittal to Congress on July 1, 1999. This latter effort began in September 1997, and consisted of a series of alternative evaluations for the C&SF Project, attempting to maximize water resource benefits for South Florida's environment, economy and citizenry and its national and international assets.

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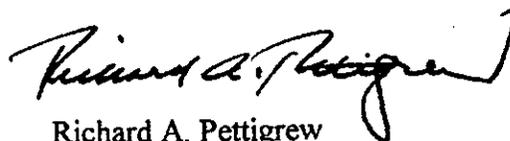
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This simultaneous transmittal of recommendations to you and the Task Force members, the Governor and the Lieutenant Governor, the Corps, and the SFWMD, is the first in a series of periodic assessments intended to ensure that a full range of opportunities for stakeholder and citizen input and feedback are conveyed and utilized in the development of the Comprehensive Plan for the Restudy. These recommendations have not been approved by the Governor or Lieutenant Governor, but are being provided to them concurrently with this transmittal of the attachments to the Task Force. The Governor's comments and directions on these attachments will be sent to you when issued. The Commission intends to provide subsequent input to the Restudy process, particularly after the draft October Comprehensive Plan is released. At that time, the Commission will endeavor to elaborate on critical issues yet unresolved, such as water assurances for the natural and built system, and convey these and any additional stakeholder and interest group concerns to the appropriate governmental entities. The Commission will continue to serve as the advisory body to the Task Force by providing a forum for public input, dialogue and consideration of these Restudy issues throughout the development and authorization process.

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Sincerely,



Richard A. Pettigrew  
Chairman

## Attachments

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Lt. Governor Buddy MacKay  
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The Governor's Commission for a  
**Sustainable South Florida**

LAWTON CHILES  
 GOVERNOR

July 27, 1998

BUDDY MACKAY  
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Patricia J. Beneke  
 Assistant Secretary for Water and Science  
 U.S. Department of the Interior  
 1849 C Street, NW, Room 6660  
 Washington, D.C. 20240

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- CLARA WILLIAMS
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Dear Assistant Secretary Beneke:

On behalf of the members of the Governor's Commission for a Sustainable South Florida, I am conveying to you a resolution which was unanimously approved by the Commission supporting the timely acquisition of more precise contour topographical data for South Miami-Dade County. The accelerated development of this information by the appropriate agencies will aid in essential hydrologic modeling necessary for Everglades restoration and the implementation of the C-111 Project in a manner that protects sustainable agriculture in South Miami-Dade. The Commission supports the Task Force in its efforts to facilitate the funding and development of the detailed data required to assure that this Project achieves its purposes without conflicting with the goal to buffer the natural system with open space and a compatible agricultural economy in this area.

Sincerely,

Richard Pettigrew  
 Chairman

RAP/ws  
 Attachment

- c: Governor Lawton Chiles
- Lt. Governor Buddy MacKay
- Secretary Bruce Babbitt, U.S. Dept. of the Interior
- Secretary Dan Glickman, U.S. Dept. of Agriculture
- Members of the Florida Congressional Delegation
- Members of the South Florida Ecosystem Restoration Task Force
- Members of the South Florida Ecosystem Working Group
- Members of the South Florida Water Management Governing Board
- Mayor Alex Penelas, Miami-Dade County
- Members of the Miami-Dade County Commission
- Mayor Steve Shiver, The City of Homestead
- Mayor Otis Wallace, The City of Florida City

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The Governor's Commission for a  
**Sustainable South Florida**

**RESOLUTION 98-07**

LAWTON CHILES  
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WHEREAS, the Governor's Commission for a Sustainable South Florida was designated as an advisory body to the South Florida Ecosystem Restoration Task Force (Task Force) as allowed by the Water Resources Development Act of 1996;

WHEREAS, Accurate topographic and elevation data and the models derived from this data are essential to accomplish the objectives of the ongoing Everglades restoration efforts; and,

WHEREAS, Multiple agencies of federal, state and local government are involved with Everglades restoration and they need this accurate data for essential hydrologic modeling and for the effective discharge of their duties; and,

WHEREAS, the U.S. Army Corps of Engineers (Corps) is currently completing detailed design and preparing a General Reevaluation Report (GRR) for the C-111 Basin Project to supplement the report's data with other studies relative to water quality and flood control issues of basin lands; and,

WHEREAS, the opportunity to provide additional data to the C-111 design and GRR Supplement will close shortly;

THEREFORE BE IT RESOLVED BY THE GOVERNOR'S COMMISSION FOR A SUSTAINABLE SOUTH FLORIDA that:

1. The Task Force immediately facilitate the funding and implementation of the acquisition of the appropriate six inch, contour topographical data for south Miami-Dade County, Florida prior to the end of 1998 by the United States Geological Survey, the United States Department of Agriculture, Corps, the South Florida Water Management District and other agencies deemed appropriate by the Task Force.

2. That the appropriate Task Force members develop, coordinate, and deploy the necessary resources for essential hydrologic modeling for south Miami-Dade County, Florida as soon as possible so as to meet the timetable of the C-111 Project.

Resolved this 24<sup>th</sup> day of July, 1998  
 Governor's Commission for a Sustainable South Florida

By: Richard A. Pettigrew  
 Chairman



**THE GOVERNOR'S COMMISSION FOR A SUSTAINABLE SOUTH FLORIDA  
MODIFIED WATER DELIVERIES REPORT**

July 24, 1998

I. Background

The rehydration of Northeast Shark River Slough to function as close to natural conditions as possible (commonly referred to as the "Modified Water Deliveries Project" [Project]) is essential to the restoration and preservation of the Florida Everglades. Several elements of this critical situation must be understood:

- (a) Modified Water Delivery is essential to saving the Water Conservation Areas (WCAs), as well as Everglades National Park (ENP). Failure to implement modified water delivery means that water will remain higher than appropriate in the WCAs (especially WCA 3-A), continuing to cause destruction of the natural environment.
- (b) Modified Water Delivery is essential to saving numerous endangered species, whose critical habitats are in the WCAs and ENP. The flooding of the critical habitats, arising from the failure to implement modified water delivery, produces severe adverse impacts on endangered species.
- (c) Expeditious implementation of the Project is essential. PL 101-229 (1989) mandated that ENP expansion be completed by 1994 and the General Design Memorandum (completed in 1992 and submitted to Congress in 1993 pursuant to PL 101-229) proposed completion of the Project by July 1998 (proposed completion of the 8.5 Square Mile Area mitigation project by 1997). Engineering and coordination should be worked out among all responsible agencies and interested parties.
- (d) Northeast Shark River Slough must be rehydrated, with the consequences to adjacent lands addressed, under the best option available, which may be one of the locally preferred options currently under review. Failure to proceed with rehydration of the Slough is clearly unacceptable.

II. Everglades National Park Expansion

- (a) The Secretary of the Interior should expeditiously undertake the Declaration of Taking procedures, by immediately submitting to the appropriate Congressional Committees his letter of intent to submit a Declaration of Taking of the Park expansion area identified in PL 101-229 (1989). Declaration of Taking procedures allow the Secretary, with the consent of Congress, to acquire title in advance of the completion of settling compensation disputes or litigation. Thus, the land could be flooded immediately upon completion of engineering aspects of the modified water delivery project. This approach is superior to a "legislative take" approach and to a "parcel-by-parcel" takings approach.

- (b) The appropriate Congressional Committees should expeditiously approve (by no later than the end of the 105<sup>th</sup> Congress, Second Session) a Secretarial request for Declaration of Taking authority.
- (c) Congress should expeditiously appropriate the remaining funds necessary for acquisition of the Park expansion lands. These funds can be deposited with the court to accompany Secretarial Declarations of Taking.
- (d) The U.S. Department of Justice should provide the personnel necessary to expeditiously file in court and execute Secretarial Declarations of Taking.

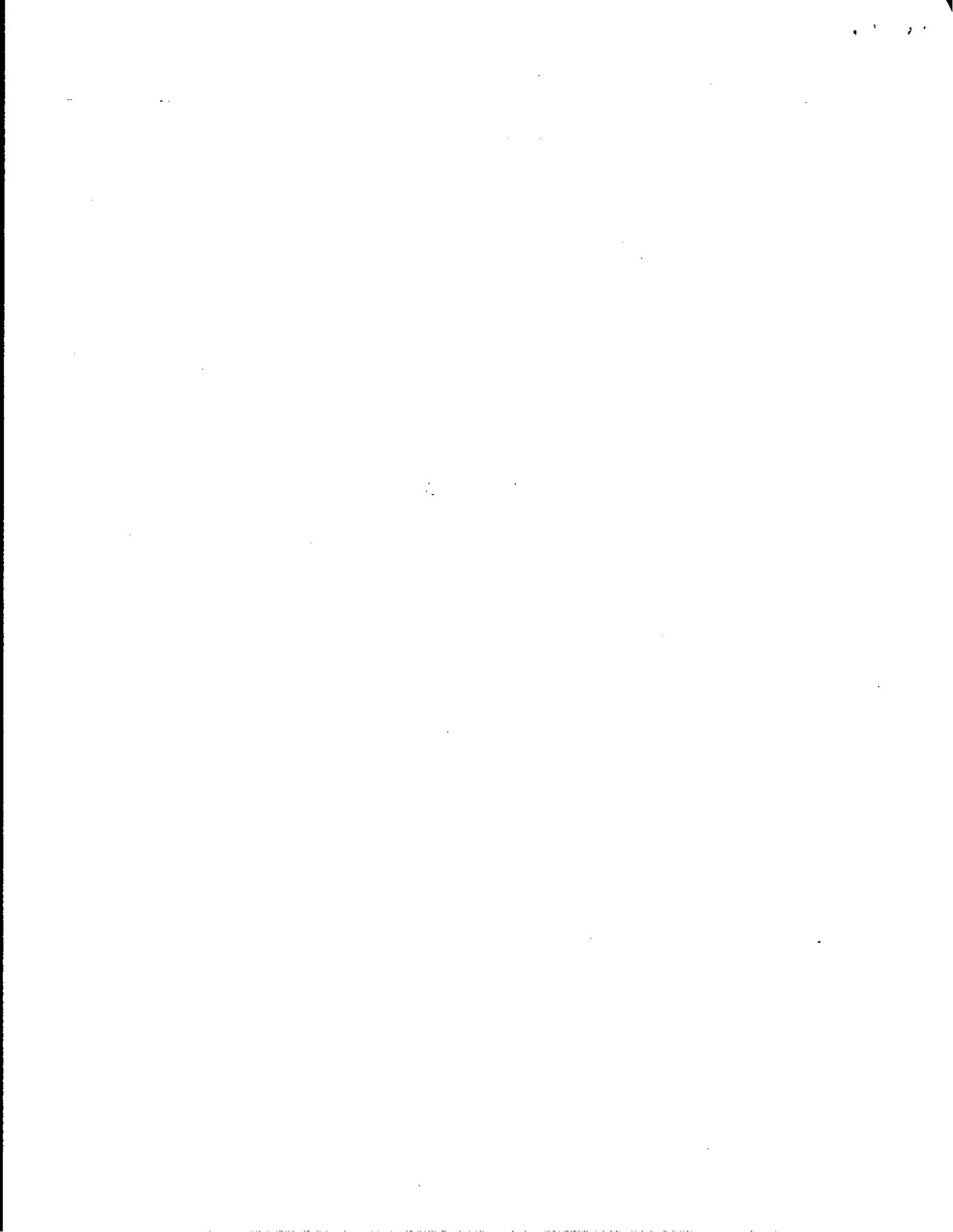
### III. 8.5 Square Mile Area

- (a) The Secretary of the Army has been directed by PL 101-229 (1989) to implement modified water deliveries.
- (b) The South Florida Water Management District (SFWMD) is the local sponsor for the Project. As a result of recommendations from the Governor's East Everglades 8.5 Square Mile Area committee (1995), the SFWMD is considering a local option to the mitigation plan for the 8.5 Square Mile Area.
- (c) The Secretary of the Army and the Secretary of the Interior should support the SFWMD in its evaluation of alternatives, which should include discussions with Miami-Dade County, and urge that it quickly complete its review of a local option and forward a recommendation to the Army Corps of Engineers for approval.
- (d) The SFWMD should complete its consideration including but not limited to
  - (1) making a decision on a locally preferred option contingent on funding from local, state and federal affected interests by no later than December 31, 1998; and
  - (2) should complete its:
    - (i) recommending the locally preferred option, including a plan for any necessary land acquisition, to the Secretary of the Army;
    - (ii) securing funding commitments from local, state and federal affected interests;
    - (iii) modifying the Project Cooperation Agreement for the Project as quickly as possible, but no later than September 1999.
- (e) If the SFWMD completes the action(s) in (III)(d)(1) above ("making a decision on a locally preferred option"), then it should immediately commence a willing seller program for those areas identified in the locally preferred option. If the SFWMD completes the action(s) in (III)(d)(2) above ("recommending" and "securing funding"), then it should immediately use its full authority to complete acquisition, unless otherwise delayed by lack of necessary Corps approval.
- (f) A locally preferred option should not be considered viable unless the responsible agency (including but not limited to the SFWMD) officially designates the alternative by formal action of its agency head, in sufficient detail to describe its scope, function, and potential financing.

- (g) The SFWMD should expeditiously commit to funding a reasonable percentage of the costs of implementation of the locally preferred option. The SFWMD should further seek funds to complete the implementation from affected local, state and federal interests. Upon finalization of funding commitments, the SFWMD shall modify the Modified Water Deliveries Project cooperation Agreement to provide assurance of implementation by the Army Corps of Engineers.
- (h) The Secretary of the Army should expeditiously consider and act on any local option recommended by the SFWMD, or failing to receive such a recommendation by September 1999, move forward expeditiously in consultation with the Secretary of Interior on a solution consistent with the federal purposes of the Project as provided for in PL 101-229 (or any amended version).
- (i) Congress and state/local governments, as may be appropriate, should expeditiously appropriate the funds necessary to quickly implement the Project.
- (j) The Federal government should contribute to any locally preferred option no less than the amount of funds it would otherwise expend for the mitigation project under PL 101-229 in the GDM (as amended or as otherwise determined by the Corps). The Task Force should advise the District whether any additional funds might be available to assist in financing the locally preferred option.

#### IV. Coordinated Planning and Implementation Process

All responsible agencies should continue the coordinated planning and implementation process that expedites the implementation of the Project as described in PL 101-229 (or any amended version).





*The Governor's Commission for a*  
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**An Interim Report on the C&SF Project Restudy**

**By**

**The Governor's Commission for a Sustainable  
South Florida**

**August 11, 1998**



A report of the Florida Department of Community Affairs, Florida Coastal Management Program, pursuant to National Oceanic and Atmospheric Administration Award No. NA 77OZ0183. The views expressed herein are those of the authors and do not necessarily reflect the views of the State of Florida, NOAA or any of its subagencies.

July, 1998

# INTERIM RESTUDY RECOMMENDATIONS

## A. INCREASE WATER STORAGE

### Providing Additional Water Storage through the C&SF Project

Today, the greatest constraints of the Central and Southern Florida (C&SF) Project are the lack of sufficient water storage and the inability to adequately use existing storage because of seepage losses, evaporation, and the limitation on management flexibility. These constraints interfere with Everglades restoration and the provision of other water-related needs of the region. The historical greater Everglades depended on a large natural storage capacity within the system that helped slow down the rate of water loss, ensuring that wet conditions and extended hydroperiods were maintained well into most dry seasons (typically, November through April). The wet season (May through October) experiences about 70-75% of the region's annual rainfall, and this natural dynamic storage capability of the Kissimmee-Okeechobee-Everglades system helped maintain not only the long hydroperiod sawgrass wetlands of the central Everglades, but also the dry season's inflows of freshwater to the area's rivers, estuaries and mangroves.

A century of efforts to drain and manage water for human uses has resulted in the loss of approximately 6 million acre-feet of annual water storage from the system. Today, an extensive network of canals, channels, drainage ditches and water control structures quickly drains the over 50 inches of annual rainfall that the region receives. This ends up sending "to tide" much of the wet season water that used to be naturally stored within an Everglades ecosystem that was twice the size of the system that remains today. This inability to store water has resulted in both wet and dry season impacts to the remaining natural system in South Florida.

As the system is managed today, during wet seasons, excess water frequently needs to be released from Lake Okeechobee. Water management requirements send damaging freshwater releases to the Caloosahatchee and St. Lucie Estuaries. During the dry season, when tourism and winter visitations are at their peak, human water supply demands within the region are at their highest, often depending upon water supply deliveries from Lake Okeechobee or the Water Conservation Areas (WCAs). Some dry periods are extensive enough to result in local or regional water shortages, sometimes resulting in water use restrictions. Neither Lake Okeechobee nor the WCAs can store enough water to adequately meet all dry season needs of both the human and natural systems, without harming their own ecologies. The result is that the existing natural system suffers by receiving less freshwater than it did historically. In general terms, the rivers, lakes, wetlands, and estuaries of South Florida experience, to their detriment, much greater wet season peak flows, and much lower dry season inflows, than they did historically.

It is necessary to create additional water storage sources and flexibility within the system to ensure that regional water supply needs of both the human and natural systems

can be more routinely provided. The key is regaining lost water storage capacity within the system. The Restudy has identified a series of ways that this could be accomplished:

- Flood releases from Lake Okeechobee could be used to fill regional storage facilities prior to allowing discharges to the Caloosahatchee and St. Lucie estuaries.
- Storage facilities could be used to capture water prior to entering Lake Okeechobee.
- Operational and structural modifications to existing project features, along with new reservoirs, Water Preserve Areas, seepage barriers, and Aquifer Storage and Recovery (ASR) could enhance stormwater storage for environmental, urban, and agricultural uses including water supply and flood control.
- Increased water levels and stormwater storage adjacent to the Water Conservation Areas in Miami-Dade and Broward Counties could prevent excessive seepage loss from the Everglades and provide increased flows to Shark River Slough, Florida Bay, and Biscayne Bay.
- Taking advantage of the seasonal nature of water availability from the regional system, and the greater use of local sources for meeting the demands of urban water supply, could allow greater use of the regional water supply system for enhancing the ecologic health of the Everglades and Florida Bay.

Clearly, increased water storage is at the heart of the Restudy. Unless the Restudy can provide for sufficient, additional water storage with the proper characteristics of location, storage volume, water quality and availability when needed, both the human and natural systems in South Florida will be harmed. The Restudy must employ enough additional storage to capture virtually all excess water currently released to tide, in order to ensure adequate water supplies for all existing legal users while protecting the health of South Florida's Everglades and other wetlands, estuaries and marine systems. The spring 1998 episode involving over 1.4 million acre-feet of emergency Lake Okeechobee water releases to the Caloosahatchee and St. Lucie Estuaries, coupled with the devastating environmental, economic, and human impacts that resulted from the releases, and the subsequent needs for that lost water as the region headed into drought conditions, demonstrate the inextricable linkage between the natural and human systems in South Florida. Therefore, it is crucial that the storage facilities developed by the Restudy allow for the attenuation of currently damaging regulatory releases from Lake Okeechobee by redirecting excess wet season flows to new storage areas for both human and environmental water supply needs during the dry season.

Likewise, the storage facilities proposed by the Restudy must contain sufficient water storage capacity to avoid a situation where the natural system is significantly harmed for human water supply needs during periods of drought. In order to achieve the balance of being able to provide adequate water supplies to sustain both human and environmental needs, the necessary structures and improvements to provide this additional water storage capacity is essential. Otherwise, the past and current water woes

of South Florida will only continue to become more extreme as the region's population continues to increase into the future.

ASR facilities have been in operation in the United States for about thirty years, and ASR is generally defined as "the storage of water in a suitable aquifer through a well during times when water is available, and recovery of the water from the same well during times when it is needed" (Pyne, 1995). In essence, the technology allows aquifers to be used as underground water storage reservoirs. The first ASR facility in Florida was permitted in 1982 and the State currently has seven operational ASR facilities, with an additional eight under construction as of February, 1998 (Lou Devillon, personal communication). Many of these facilities have multiple wells, with the largest currently operating systems (Peace River/Manasota Regional Water Supply Authority; City of Cocoa) able to recover about 8 million gallons/day or about 25 acre feet/day (GCSSF, 1996b). These facilities utilize either treated surface water or treated groundwater as their supply source. Even larger ASR facilities have recently been permitted in Florida to use reclaimed water as their source water. Some of the twenty-two applications identified for ASR (Pyne, 1995), that may be applicable for South Florida, include:

- **SEASONAL STORAGE.** Storage during wet months for recovery during dry months or when needed.
- **LONG-TERM STORAGE.** Storage during wet years for recovery during drought years.
- **RESTORE GROUNDWATER LEVELS.** Reverse groundwater level declines by incorporating ASR systems.
- **AGRICULTURAL WATER SUPPLIES.** Provide seasonal storage of water for agricultural irrigation purposes.
- **ENHANCE WELLFIELD PRODUCTION.** Wellfields are usually designed to operate within their long-term safe, sustained yield. When these same wellfields are converted to ASR mode, it is often possible to produce water at higher rates during peak demand months, counting on artificial recharge during off-peak months to restore water levels before the next peak season.
- **COMPENSATE FOR SURFACE SALINITY BARRIER LEAKAGE LOSSES.** In South Florida, salinity barriers are located on major drainage channels discharging to saltwater. With ASR, wells could be located adjacent to these barriers, recharging water into deep brackish aquifers during wet months; stored water would be recovered during drought months to compensate for leakage losses.

- **RECLAIMED WATER FOR REUSE.** High quality reclaimed water may be stored seasonally in brackish aquifers for recovery to meet irrigation demands, eliminating the need for expensive aboveground storage.

ASR's application is increasing nationally since, with appropriate quality of the injected water, it creates few environmental impacts, is cheaper than many other water storage options, and can efficiently store water for later retrieval, even across multiple years. However, the use of large-scale ASR for supplying the huge amounts of water in regional water storage facilities like those the Restudy is proposing (i.e. a total of 1,665 MGD or 5,100 acre feet/day) has never been attempted at this scale, and therefore is currently unproven as a reliable large-scale technology. This uncertainty is a major concern for water users, such as in the Everglades Agricultural Area (EAA) and by the Miami-Dade, Palm Beach, Broward and Lee County utility interests, who are proposed in the Restudy to have to rely upon this regional ASR storage for a significant portion of their water needs. This uncertainty prompted the Commission, in its Conceptual Plan, to recommend that "ASR technology should be investigated to determine its feasibility at a regional scale" (GCSSF, 1996b; p. 47).

### PREVIOUS COMMISSION GUIDANCE

The Commission feels that clear guidance on several water storage concerns has already been provided by its 1996 *Conceptual Plan for the C&SF Project Restudy*. Table 1 below represents a portion of the water storage guidance previously developed in the Conceptual Plan that the Commission feels is especially important for the Task Force and the Restudy team to take into consideration as the Comprehensive Plan continues to be developed:

Table 1

### **WATER STORAGE GUIDANCE IN THE CONCEPTUAL PLAN (1996)**

#### **Maximize Storage**

- Maximize Lake Storage Without Environmental Harm – No significant impacts to the littoral zone or water quality should be allowed. Damage to the east and west coast estuaries by the current regulation schedule must be addressed. (p. 15)
- Sufficient water to meet competing demands can only be provided by maximizing storage. (p.25)

#### **Equitable Storage Distribution**

- The burden and responsibility for water storage should be shared across the system. (p. 22; Fundamental General Concept)
- Water storage should be provided throughout the entire system and in such a way that no single area is environmentally damaged by excessive storage requirements or bears disproportionate share of the storage burden. (p. 25)

#### **The Need to Develop Contingency Plans**

- The Restudy should develop plans to mitigate and replace any water supply lost through system modifications for environmental restoration. (p. 39)

#### **Lake Okeechobee Operations & Littoral Protection**

- The Commission believes a new operational plan for the Lake is needed that maximizes storage opportunities, protects the east and west coast estuaries, restores the ecological health of the Lake, and enhances wildlife populations. The ability to accomplish these goals greatly depends on additional storage throughout the system and on other improvements to the C&SF Project. (p.28)

#### **Water Conservation Areas Operation & Environmental Protection**

- The current WCA regulation schedules need to be modified to schedules based on more natural conditions. The goal is to replicate more natural hydropatterns within the WCAs and to maintain and restore native wetland and upland plant communities. (p.35)
- Modify WCAs to Create Contiguous Natural Area – Restore the connectivity of the WCAs to the maximum feasible extent consistent with the ability to maintain flood protection and habitat quality, and to replace, through storage in the overall system, any existing urban water supply that may be lost. (p. 16)

#### **Keeping the Holey Land & Rotenberger Tracts as Natural Areas**

- These actions may also help restore the ecological processes and relationships, and the diversity and numerical abundance of animals that can only come by reestablishing the central and southern Everglades and Big Cypress into a single, fully integrated ecosystem. This concept proposes to restore ecological continuity to areas that are currently treated as geographically and hydrologically distinct. These areas include the three Water Conservation Areas, the Rotenberger/Holey Land tracts, the Big Cypress National Preserve, Ten Thousand Islands, Fakahatchee Strand, Mullet Slough, Corkscrew Swamp, Caloosahatchee Slough, Rookery Bay, Everglades National Park, the Model lands, Florida Bay, the Florida Keys, and associated estuarine and marine waters. (pp. 33-34)
- Restoration of more natural flows and hydropatterns in the Everglades, Holey Land and Rotenberger tracts and other natural areas should control the subsidence and potentially reverse the trend by creating conditions favorable to the accretion of peat soils. (p.53)

#### **Building Storage in the EAA**

- The Commission recommends that the determination of sufficient land to accomplish storage in the EAA be based on need, science and appropriate cost-benefit analyses. The Talisman property is currently being considered for acquisition by the State for use as a water storage area. The Commission supports the acquisition of up to the equivalent of the Talisman property as a target of opportunity for increased storage. Additional areas may be considered. Until the total storage volume, size and depth of storage areas are designed and optimized during the Restudy, based on analyses of costs, benefits, needs and impacts, all land acquisition should be made with willing sellers and in consultation with local landowners. Acquired lands could be returned to agricultural use if not needed for restoration activities. (p.30; see also p.15)

#### **Efficiently Capturing, Storing and Reusing Water**

- Implement Southern L-8 basin / Loxahatchee Slough – There should be no negative environmental impacts. This option is an example of a project that could salvage, clean-up, and reuse water. It would require local government consultation and review in concert with the Restudy. (p.16)

#### **Location & Associated Socio-Economic Impacts**

- St. Lucie Canal and Caloosahatchee River Basins – The siting of these facilities should, to the maximum extent practicable, avoid primary or secondary impacts to existing wetlands and adjacent uplands, both of which contribute to a viable ecosystem and economy. (p.27)
- Caloosahatchee – Water Storage Areas (Regional Attenuation/Reservoir facilities) – Locations of potential storage areas should be chosen in consultation with local landowners. (p.15)
- Upper East Coast – Water Storage Areas (Regional Attenuation) – Locations of potential storage areas should be chosen in consultation with local landowners. (p.16)

**Water Preserve Areas**

- Capturing and storing excess stormwater runoff in the WPAs could serve as additional storage areas for urban water supply and enhance recharge of the Biscayne Aquifer. (p.39)

**Size Needed**

- St. Lucie Canal and Caloosahatchee River Basins – The storage areas and their associated water treatment facilities should be sized and designed to be ecologically consistent with the location. The total storage volume, coupled with the size and depth of the storage areas, need to be optimized as a part of detailed design during the Restudy. (p.27)

**Efficiency of Distribution/Economy of Scale**

- St. Lucie Canal and Caloosahatchee River Basins – Ideally, individual upland storage areas would be divided among the various sub-basins and would be interconnected to provide for maximum flexibility of water management options among basins. (p.27)

**Regulatory Obstacles to ASR Use**

- In planning a pilot study for large-scale ASR, several issues need to be addressed. These include environmental and health concerns regarding water quality, current regulatory constraints, costs of the project, and potential benefits of having additional clean water at the chosen site. (p. 47)

**Expensive Cost Concerns about ASR**

- Lake Okeechobee – ASR – The maximum additional storage and cost effectiveness should be evaluated. Impacts to the littoral zone should be minimized. (p. 15)
- Acquiring sufficient lands to hold all of an average year's estuarine discharge is cost prohibitive. Using ASR in combination with EAA storage has the potential to store large amounts of water at its source and close to the demand while protecting the ecological health of the estuaries and the lake. (p. 47)
- Caloosahatchee – ASR – The maximum additional storage and cost effectiveness should be evaluated. Impacts to the littoral zone should be minimized. (p. 15)

**Too Much Reliance on Unproven ASR Technology**

- ASR technology should be investigated to determine its feasibility at a regional scale, as well as its environmental impacts. ... ASR should be tested to evaluate technical uncertainties with high capacity applications (p. 47)

However, the Commission has also identified several new water storage issues that are not sufficiently covered by the guidance provided by the earlier Conceptual Plan. These new recommendations are discussed and presented below.

**RECOMMENDATIONS**

1. The Restudy should ensure that a sufficient flexibility of alternative water storage options is maintained throughout all planning, in order to allow for substitution of plan components for ASR, in ground curtain wall reservoirs, or any other major water storage feature including seepage control management, should substitution become desirable for cost or performance reasons.
2. The Holey Land and Rotenberger tracts should not be developed into storage reservoir areas, as they consist of important remnants of the northern sawgrass plains of the historic Everglades.

3. The Comprehensive Plan should develop a specific contingency plan for the potential need to substitute plan components for the major operational and structural storage components proposed in the Restudy.
4. In the event that there is a shortage or excess in water for existing storage, all systems should share in the adversity resulting from the imbalance in storage. However, the Restudy should provide sufficient facilities that protect natural systems such that natural systems will not have to accept a water storage adversity in either wet or dry periods that would cause significant harm to native vegetative or faunal communities, nor should water user groups have to accept adversity that significantly impacts human health and safety.
5. The Corps should accelerate the design and implementation of demonstration and pilot ASR projects at selected sites around Lake Okeechobee and Southeast Florida. Information from these projects will assist in determining the feasibility of ASR for major water storage projects.

## **B. LAND PROCUREMENT AND CONNECTIVITY**

### **Employing Innovative Methods of Land Procurement**

One of the basic tenets of Everglades restoration holds that restoration goals will only be achievable if the vast quantities of excess water above that required by coastal estuaries are retained and stored in the South Florida ecosystem. Accomplishing this goal of water storage will require converting large areas of land into storage areas. Much of this land is privately owned and must be procured either through fee simple acquisition (outright purchase) or other appropriate means. Some of the most notable areas where lands must still be acquired include areas in the Everglades Agricultural Area, the Water Preserve Areas, the 8.5 Square Mile Area, the East Everglades, and Golden Gate Estates.

Appropriate legal interests in vast acreages of land must be secured if South Florida ecosystem restoration is to succeed. Unfortunately, both funds and time are limited. The cost of land acquisition for water storage purposes alone is likely to amount to billions of dollars and constitutes a significant portion of the costs of restoration. Procuring land through the conventional method of fee simple acquisition is likely to leave restoration efforts with a deficit of both needed land and water storage capacity. The lack of a reliable and consistent funding source also hampers land procurement activities. As South Florida continues to develop and suitable lands become scarce for restoration purposes, the options for land procurement are being foreclosed.

New and innovative means of procuring legal interest in land for South Florida ecosystem restoration purposes that provide incentives to landowners must be utilized since adequate funds for outright purchase of all needed lands may not be available. Furthermore, in order to ensure that land procurement programs move consistently forward year to year, a dedicated source of funds must be established to acquire or otherwise procure the needed rights to lands that are essential to the implementation of South Florida ecosystem restoration.

### **PREVIOUS COMMISSION GUIDANCE**

The Commission feels that clear guidance on several land procurement concerns has already been provided by its 1996 *Conceptual Plan for the C&SF Project Restudy*. Table 2 below represents a portion of the land procurement guidance previously developed in the Conceptual Plan that the Commission feels is especially important for the Task Force and the Restudy team to take into consideration as the Comprehensive Plan continues to be developed:

Table 2

**LAND PROCUREMENT GUIDANCE IN THE CONCEPTUAL PLAN (1996)**

**Expeditious Acquisition in the WPAs:**

- The exact extent, design, and operation of the WPAs should be determined as part of the Restudy. However, time is of the essence, as lands in some of the proposed WPAs are being rapidly converted to uses that are incompatible with their potential use as WPAs. Therefore, accelerated acquisition of critical lands is needed to ensure that this concept remains viable. (p. 33)

**Land Acquisition in the Everglades Agricultural Area to Implement the Restudy**

- The Commission recommends that the determination of sufficient land to accomplish storage in the EAA be based on need, science and appropriate cost/benefit analyses. The Talisman property is currently being considered for acquisition by the State for use as a water storage area. The Commission supports the acquisition of up to the equivalent of the Talisman property as a target of opportunity for increased storage. Additional areas may be considered. Until the total storage volume, size and depth of storage areas are designed and optimized during the Restudy, based on analyses of costs, benefits, needs, and impacts, all land acquisition should be made with willing sellers and in consultation with local landowners. Acquired land could be returned to agricultural use if not needed for restoration activities. (p. 30)

**Other Land Procurement Tools**

- A public/private partnership may offset the cost or reduce the need for acquiring portions of the WPAs (including but not limited to land donations, land swaps, and less than fee simple acquisitions). (p. 32)

**Land Use**

- Acquired lands can be returned to agricultural use if not needed for restoration activities. (p. 30)

**RECOMMENDATIONS**

6. During implementation of the Restudy, innovative solutions to surface water storage should be considered, such as leasing private land to store public water.
7. The State of Florida as well as the federal government should explore and implement a fair and equitable dedicated funding source for the long-term restoration of the South Florida ecosystem.
8. Accelerate land acquisition in the Water Preserve Areas and from willing sellers in other areas identified by the Restudy. In the interim, all agencies and jurisdictions should discourage land use density, permitting, and infrastructure decisions that create impacts to areas within and immediately adjacent to the WPA footprint that may be incompatible with restoration goals.
9. Procured lands should be managed for compatible multiple uses consistent with Florida law. Use and management activities on these lands must be compatible with overall restoration and conservation goals.

## Restoring Connectivity and Spatial Extent to the Everglades Ecosystem

The historic Everglades watershed was once much larger than it is today. Man-made alterations to this vast ecosystem have not only reduced its spatial extent by 50%, but also fragmented or "compartmentalized" its hydrological and ecological characteristics and processes. Most scientists believe that the single greatest reason for the extensive degradation of the Everglades ecosystem is the disruption of the watershed's spatial extent and hydrologic continuity. Connectivity of watercourses, vegetation types, and habitat was a key characteristic of the historic Everglades ecosystem. Restoration of these spatial relationships and processes should be a fundamental goal of the Restudy.

The internal network of levees in the managed system has restructured the Everglades into an unnatural mosaic of over-flooded and over-drained wetlands. These modifications to the historic Everglades have effectively converted a single expansive and interconnected ecosystem into a number of smaller, hydrologically and ecologically disconnected systems. The hydrological consequences of this conversion include upsets to the natural timing, duration and spatial extent of flooding and drying patterns throughout the Everglades. Disruptions to the natural hydrological processes of the ecosystem have also resulted in unnatural patterns of freshwater delivery to coastal ecosystems such as Florida and Biscayne Bays. Coastal estuaries such as the Caloosahatchee and St. Lucie have suffered as a result of too much and too little deliveries of freshwater. The loss of the sheet flow of water through the South Florida ecosystem has affected natural patterns of nutrient cycling and transport. Canals have accelerated water flow rates, altering fish species population composition and affecting their survival.

The ecological consequences of compartmentalization within the Everglades include the fragmentation of habitat and the isolation of wildlife. The spatial extents of breeding territories and foraging ranges for some species are no longer provided by the current ecosystem. Physical barriers such as canals and levees are one cause of this fragmentation of wildlife habitat. Another barrier has been created by new water depths and new flow patterns. Compartmentalization has been a major factor in the collapse of historic wading bird populations and nesting sites. Finally, levees and canals have become routes of invasion and dispersal for exotic plants and fishes.

Reestablishing the hydrological and ecological continuity of the remaining Everglades ecosystem should be one of the primary goals of the C&SF Restudy. The Conceptual Plan for the Restudy recommended, as one of its 40 preferred Restudy options, restoration of the connectivity of the Water Conservation Areas to the maximum extent feasible and compatible with the maintenance of flood protection and the protection of habitat quality. Modifications of structural components such as levees and canals are specifically recommended as a means of restoring hydrological and ecological characteristics and functions. The ability to fully decompartmentalize the Everglades ecosystem, however, may be limited by the dual objectives of flood protection and protection of existing habitats, such as the tree islands.

The Commission's Conceptual Plan also emphasized the importance of increasing the spatial extent and quality of wetlands beyond the Everglades. For example, in refining its Initial Draft Plan, the Corps should seek to expand the spatial extent and quality of wetlands in the Bird Drive Basin, located in west-central Miami-Dade County.

PREVIOUS COMMISSION GUIDANCE

The Commission feels that clear guidance on several connectivity concerns has already been provided by its 1996 *Conceptual Plan for the C&SF Project Restudy*. Table 3 below represents a portion of the connectivity guidance previously developed in the Conceptual Plan that the Commission feels is especially important for the Task Force and the Restudy team to take into consideration as the Comprehensive Plan continues to be developed:

**Table 3**

**CONNECTIVITY GUIDANCE IN THE CONCEPTUAL PLAN (1996)**

<p><b>Connectivity</b></p> <ul style="list-style-type: none"> <li>• Improve connectivity and reduce fragmentation of habitats within and between areas that are currently treated as geographically and hydrologically distinct. (pp. 14 &amp; 33) Restoring connectivity involves structural and/or operational changes within the remaining natural areas for the benefit of the entire ecosystem. (p. 34)</li> <li>• These areas include the WCAs, Rotenberger and Holey Land, Big Cypress National Preserve, Ten Thousand Islands, Fakahatchee Strand, Mullet Slough, Corkscrew Swamp, Caloosahatchee Slough, Rookery Bay, Everglades National Park, the Model Lands, Biscayne Bay, Florida Bay, the Florida Keys, and associated estuarine and marine waters. (p. 34)</li> </ul> <p><b>Sheetflow</b></p> <ul style="list-style-type: none"> <li>• Restore more natural hydropatterns, including associated sheetflow. (p. 14)</li> </ul> <p><b>Consistency with Other Objectives</b></p> <ul style="list-style-type: none"> <li>• Restore connectivity of the WCAs to the maximum extent feasible consistent with the ability to maintain flood protection and habitat quality, and to replace, through storage in the overall system, any existing urban water supply that may be lost. (p.16)</li> </ul> <p><b>Water Conservation Areas</b></p> <ul style="list-style-type: none"> <li>• Replicate more natural hydropatterns within the WCAs and maintain and restore native wetland and upland communities. Structural modifications to the levees and structures currently compartmentalizing the WCAs and changes in operational plans should be investigated for this purpose. Some levees and structures may still be necessary to create desirable hydrologic and ecologic conditions throughout the area. (p. 35)</li> </ul> <p><b>Water Preserve Areas</b></p> <ul style="list-style-type: none"> <li>• The purpose of the WPA concept is to: (1) increase storage and hold more water in the system by controlling seepage from natural areas; (2) capture and store excess stormwater currently discharged to coastal waters, thus retaining an important water supply source for both urban and natural systems; (3) provide a buffer between the natural and developed areas; (4) preserve and protect wetlands outside the publicly owned Everglades; and (5) provide important transitional land uses between the natural and developed areas. ( p. 30-31)</li> </ul>
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**Big Cypress National Preserve**

- The L-28 levee presently separates WCA-3A and the Big Cypress National Preserve. To restore hydropatterns within the Big Cypress National Preserve, this levee, Tamiami Trail, and Loop Road may need to be modified. (p. 36)

**Everglades National Park**

- Structural modifications to the L-29 levee and improving conveyance through Tamiami Trail (bridge structure) from CR 951 to the north-south levee should be evaluated. Flamingo Road acts as a levee during high flow conditions. Adding culverts, bridges, or other improvements to Flamingo Road will remove a hydrological barrier and restore more natural flows within the area. (p. 37)

**Biscayne National Park**

- The reconnection of Biscayne Bay to more natural freshwater flows from the mainland should be made. (p. 38)

**RECOMMENDATION**

10. The Corps should continue to refine the Initial Draft Plan to seek improved hydrologic connectivity and sheetflow in the remnant Everglades.
11. In refining its Initial Draft Plan, the Corps should seek to expand the spatial extent and quality of wetlands in the Bird Drive Basin, located in west-central Miami-Dade County.

## C. IMPROVING WATER QUALITY

### Providing for Water Quality with the Restudy

Natural systems in South Florida evolved under very low levels of nutrients and in the absence of man-made pollutants. As South Florida has developed, degradation of the Everglades ecosystem and most coastal estuaries has occurred. Diverse activities associated with urban development, recreational activities, agricultural activities, and other activities such as mosquito control and vegetation control, have contributed to water quality degradation. In addition to nutrients, impacts have been caused by pesticides, heavy metals such as mercury, and other chemicals. As South Florida continues to grow, so do the threat of increased water pollution and the need for protection of both the natural system and the human population of South Florida.

Construction of the C&SF Project has been instrumental in providing the primary flood control system that allowed the full extent of current development. That flood control system initially brought about major changes to the ecosystem by altering water movement patterns, which continue today to impact most remaining natural areas. One of the continuing impacts results from the fact that the original C&SF Project did not anticipate pollutant levels currently being introduced. As the Project is modified, it is essential that all associated problem areas related to the operation of the C&SF Project be addressed. To adequately deal with these water quality issues in the future, additional State, regional and local action will be required if real ecosystem restoration is to occur.

A number of issues regarding water quality problems and the adequacy of the C&SF Project Restudy's response to those problems have been raised by representatives of public interest groups, as well as being previously described in the Commission's Conceptual Plan and Initial Report. These concerns included questions such as:

- How extensively are water quality issues being addressed in the Restudy?
- Should the Restudy expand its water quality component?
- How do we integrate water quality source issues into storage siting?
- Is adequate water quality monitoring being considered for return water from storage in the Caloosahatchee basin?
- Should water quality concerns focus on other pollutants in addition to phosphorus? If yes, what are the measures to be undertaken to adequately rectify possible pollution problems?
- How do we determine and allocate responsibility for water quality improvement?

Because of the nature of historical impacts to the Everglades and the difficulty in finding a concise, yet comprehensive, water quality data set addressing the entire system, phosphorus has been the Restudy's primary water quality focus. Stormwater Treatment Areas (STAs), and to some extent WPAs and reservoirs, can provide treatment for pollutants in addition to phosphorus. However, understanding is incomplete about the types, concentrations, and loads of pollutants that are causing existing ecological problems and likely to create future ecological problems at critical locations.

This lack of complete understanding exists in spite of a significant monitoring effort. A number of regulatory agencies and non-regulatory agencies routinely collect large quantities of water quality data in the region, yet this data is seldom collected in conjunction with important events such as agricultural pesticide and fertilizer applications, major stormwater discharges or pumping activities. Much of the collected data is not consolidated into a comprehensive database, nor analyzed or cross-correlated with other related information. Many monitoring programs are piecemeal efforts routinely collecting data at fixed locations at scheduled times which are then stored in hard-to-access data bases and, therefore, seldom used. When pollution impacts do become evident, monitoring efforts are often unable to identify the source or cause of the impacts.

Existing regulatory programs have not been comprehensive enough at preventing pollution or impairment of designated uses of some water bodies. The Florida Department of Environmental Protection's "305B Report" (DEP, 1996) to the U. S. Environmental Protection Agency (EPA) is one source of information about water bodies whose water quality is insufficient to support their designated uses. Many regulations have rules based on "presumptive" technology. This "presumption" assumes that water quality standards will be met if specified actions are undertaken by the regulated interest. While, in some instances, it may be logical to start with a "presumptive" technology based approach, monitoring to verify compliance should generally be required. For instance, if the "presumptive" technology consists of a combination of Best Management Practices (BMPs) and Stormwater Treatment Areas (STAs), a research and monitoring program should be initiated to evaluate the effectiveness of the BMPs and STAs as they are implemented in improving water quality. Where it is determined to be necessary to assure full compliance with water quality standards, supplemental technologies, with appropriate monitoring, should be used. Such an iterative approach has been implemented in the EAA for discharges to the Everglades Protection Area.

Currently, the Restudy Team is modeling a very limited number of water pollutants. For Lake Okeechobee, the Water Conservation Areas and Everglades National Park, phosphorus is the primary focus of attention. Past monitoring efforts have indicated that other water quality concerns exist, and in some areas such as the S-9 Basin, future development may create new water quality concerns. Furthermore, some of the proposed Restudy actions have the potential to cause additional water quality problems.

Current modeling for most of the Restudy's proposed alternatives indicates that the planned diversion, from Lake Okeechobee to the Stormwater Treatment Areas, of 80% of the drainage discharges from the multiple "298 Drainage Districts" and from Closter Farms does not fully occur. Additional back-pumping into Lake Okeechobee is included in some of the alternatives. No treatment is provided for the new back-pumping facility in the L-8 Basin, which includes agricultural drainage. Although greatly reduced, backpumping of untreated drainage to Lake Okeechobee from the major pump stations in the EAA still occurs. Even with additional treatment facilities included at other locations, the Restudy's modeling results predict little change in the Lake's eutrophic state. Current model inadequacies account for only a portion of the problem. Water

quality conditions in Lake Okeechobee are not likely to significantly improve unless substantial lake inflow pollution load reductions occur, and action is taken to reduce in-lake nutrient levels. The Restudy should emphasize restoration of the Lake Okeechobee ecosystem, including its water quality.

For the WCAs and the Everglades National Park, the requirements of the Everglades Forever Act and the Federal/State Settlement Agreement are included as base conditions in the Restudy and are assumed to be in place as legally required. This includes final Phase II phosphorus concentration requirements which are assumed to be the default value of 10 parts per billion (ppb), as DEP has not yet adopted a final standard. A treatment method capable of producing the expected water quality required for Phase II has also not yet been identified for implementation. Other WCA issues include the potential high flow bypass of the Stormwater Treatment Areas resulting from Restudy actions, and the additional treatment facilities needed for both increased Lake Okeechobee flows for Everglades restoration and to meet increased year 2050 Lower East Coast water supply demands.

Some current Restudy strategies dealing with these water quality concerns include various mechanisms to minimize Lower East Coast water supply deliveries from Lake Okeechobee and the WCAs. An evaluation of the effect of the C&SF Restudy alternatives on water and phosphorus budgets in the Everglades Construction Project (ECP) and the Everglades Protection Area was finished in July 1998. Consideration will be given to the effects of proposed EAA reservoirs, other water storage areas included in the technically preferred alternative plan, agricultural Best Management Practices (BMP) performance, alternative phosphorus settling rate values and water movement on ECP effectiveness and treatment design requirements. Complete results will be available by October 15, 1998.

A major effort has been made in the development of the Restudy's alternatives, to store excess water from the Lower East Coast that is currently lost to tide. Most of this water will be back-pumped into the Water Preserve Areas and into Lakebelt storage reservoirs. Much of the Lower East Coast is heavily developed and some of the canals contain water that has been polluted. The Restudy is proposing to separate cleaner canal water from canals affected by urban pollution. In some cases, treatment areas have been added or separate storage areas used for this urban affected water. In other areas, water of poorer quality that is released to recharge the aquifer and local canals is proposed to be routed back through the canals from which it was taken in order to avoid impacts to wellfields and other areas of better water quality. As development increases, it will be important to ensure that water quality does not continue to deteriorate, especially in currently unimpacted areas.

In the Restudy alternatives, water from a variety of sources including ground water, surface water, and agricultural and urban runoff are proposed for storage in wetlands, reservoirs and ASR facilities. Water released from these storage areas will have a number of uses, including the maintenance of groundwater levels, wellfield recharge, Everglades water supply and estuarine water supply. It is understood that the

Restudy's Integrated Feasibility Report And Programmatic Environmental Impact Statement (IFR/PEIS) will include a monitoring plan that is consistent with the plan's conceptual level of detail. A detailed environmental monitoring program will be necessary to adequately apply the principle of adaptive management and ensure that water quality impacts are considered during the later phases of the design process for such facilities.

In current modeling, pollutant discharges to the estuaries are considered to be primarily a matter of excessive or insufficient freshwater flows. Other potential pollutants such as pesticides, nutrients and heavy metals have not always been addressed in the modeling. In the Restudy's Initial Draft Plan, a significant portion of freshwater flows to central and southern Biscayne Bay are supplied by the South Miami-Dade reuse component. However, due to significantly high construction, operation and maintenance costs, and potential water quality implications, the Corps should investigate all potential sources of water for providing freshwater flows to central and southern Biscayne Bay.

In summary, a number of water quality problem areas currently exist within the system, and additional problems will potentially be created by Restudy modifications. Some of the major water quality problem areas involving multiple pollutants include:

- Discharges to the Kissimmee River;
- Inflows to Lake Okeechobee;
- Outflows from Lake Okeechobee to the St. Lucie and Caloosahatchee Estuaries, and the EAA;
- Ecosystem restoration deliveries from Lake Okeechobee to the Everglades Protection Area;
- Discharges from the EAA to Lake Okeechobee and the Everglades Protection Area;
- Flows from the C-139 Annex area and the Western Basin;
- Flows to WCA-3 from all Tribal lands;
- S-9 Pump Station discharges from the C-11 Basin;
- Reservoirs receiving water contaminated by stormwater runoff or atmospheric deposition;
- ASR discharges to the Floridan Aquifer and ASR discharges to surface waters;
- Sewage treatment plant reuse water discharges to natural areas;
- Discharges from the Modified Water Deliveries Project;
- Discharges from the C-111 Canal Project;
- Discharges to estuaries including the Indian River Lagoon, Lake Worth, the Intracoastal Waterway, Biscayne Bay, Barnes Sound, Florida Bay, and Southwest Coastal Estuaries; and
- Urban runoff contribution to water quality impairment: Florida Keys; Lake Okeechobee; St. Lucie Estuary; and Caloosahatchee Estuary.

Water quality treatment facilities currently included in Alternative D of the Restudy include:

<u>COMPONENT</u>	<u>FACILITY/SIZE</u>
D5 Caloosahatchee ASR	Treatment prior to injection
K6 Southern L-8 ASR	Treatment prior to injection
M6 Site 1 ASR	Treatment prior to injection
Q5 WPA C-11	1,600 acre STA/Impoundment
R4 WPA C-9	2,500 acre STA/Impoundment
S6 Central Lake Belt	640 acre STA
W2 Taylor Creek Storage/STA	5,000 acre STA
X6 C-17 Backpumping	550 acre STA
Y6 C-51 Backpumping	600 acre STA
GG4 Lake Okeechobee ASR	Treatment prior to injection
LL6 C-51 ASR	Treatment prior to injection
VV6 P.B. Co. Ag Reserve ASR	Treatment prior to injection
WW5 C-111 Spreader Canal	Unspecified acre STA
XX6 North Lake Belt C-6 Flows	Unspecified acre STA
BBB6 S. Miami-Dade Reuse	Treatment to meet standards
CCC6 L-28I Modifications	1,100 acre and 800 acre STA
DDD5 Caloos. River Backpumping	5,000 acre STA
HHH6 W. Miami-Dade Reuse	Treatment to meet standards

Components providing incidental water quality benefits in Alternative D include:

<u>COMPONENT</u>	<u>FACILITY/SIZE</u>
A6 North Storage Reservoir	20,000 acre reservoir
B2 C-44 Storage Reservoir	10,000 acre reservoir
D5 C-43 Storage Reservoir	20,000 acre reservoir
G5 EAA Storage Reservoirs	{20,000 acre drainage reservoir} {40,000 acre lake release reservoir}
K6 Southern L-8 Storage Reservoir	1,200 acre reservoir
M6 Site 1 Storage Reservoir	2,460 acre reservoir
S6 Central Lake Belt Storage	5,200 acre reservoir
U6 Bird Drive Recharge Area	2,877 acre recharge area
UU6 C-23& 24/St. Lucie Storage Reservoirs	35,200 acre reservoir
VV6 P.B. Co. Ag. Storage Reservoir	1,660 acre reservoir
WW North Lake Belt Storage	4,500 acre reservoir
GGG6 C51 Storage Reservoir	1,200 acre reservoir

### RECOMMENDATIONS

- In order to address all water quality pollutants and issues at the most appropriate stage of project planning, design, development, permitting and construction, a

water quality implementation plan for the Restudy should be developed with DEP as the lead agency, along with EPA, SFWMD, the Tribes the Corps and local permitting programs. The Corps should strive to maximize opportunities to improve water quality wherever possible within the C&SF Project within its authority.

- a. The water quality implementation plan should include elements that ensure that existing water quality data from all federal, Tribal, State, regional and local agencies are consolidated and made available in a format that makes analysis possible and simplifies the identification of problems. Future water quality monitoring programs should be fully coordinated with one another to eliminate duplication, fill existing data gaps, and to provide the most useful information possible. All water quality information should be coordinated with the Restudy process to ensure future design efforts incorporate necessary water quality considerations and to ensure that appropriate water quality data is available to assess conditions once components are on-line and operational.
  - b. The water quality implementation plan should identify studies and monitoring needed to identify effects upon the quality of water delivered downstream resulting from Restudy modifications.
  - c. In the water quality implementation plan, water quality data and applicable existing water quality programs and regulations, should be analyzed to determine the source (point or nonpoint) of water quality problems and to identify responsible entities. Where needed, regulatory requirements should be enforced and opportunities for coordination/implementation between the project and other water quality programs should be identified. Any necessary C&SF Project design changes should be coordinated with and incorporated into the Restudy.
13. The Restudy should include in the Integrated Feasibility Report and Programmatic Environmental Impact Statement (IFR/PEIS), recognition of the problem of water quality data fragmentation, inconsistency and incompleteness. The IFR/PEIS should ensure that the water quality improvement is included in all future Restudy actions; and to provide for the adaptive Restudy components and long term monitoring necessary to ensure ecosystem restoration goals are being met.
- a. The IFR/PEIS should provide a basis for a cooperative effort to develop an adequate integrated, detailed monitoring and evaluation program to include in later project development documents. This cooperative effort should include local, regional, State, Tribal and federal agencies involved with the protection of natural resources and the permitting and operation of the C&SF Project. In the future, a detailed environmental monitoring

program will be essential for the adequate application of the principle of adaptive management. This principle must be an essential element throughout the entire Restudy process.

- b. At this time, it is essential that the Restudy provide the framework for identification of all water quality issues that can be dealt with at this stage of project development. For water quality problem issues that cannot be dealt with, the issues and possible solutions should clearly be identified in the Restudy for further analysis. Relative to water quality planning and remediation, the Restudy should consider water quality issues for the entire South Florida ecosystem to the extent possible, and consistent with the authorizing legislation of the Corps' Restudy. It is important that the Restudy consider the source of the water, quality of the water, and the ultimate use of the water when selecting the appropriate storage system, location, and necessary treatment for water included in the Restudy. Within the IFR/PEIS should be the recognition of the critical need to deal with all water quality issues at the most appropriate stage of project planning, design development, permitting and construction. It should include an identification of appropriate mechanisms to address all remaining water quality issues during future stages of project design and development. An adaptive management commitment should be made in the IFR/PEIS that will allow water quality problems identified during future work on the project to be adequately addressed.
  - c. A report should be provided to the Commission outlining the specific actions being proposed in the Restudy to address the issues raised.
- 14. The Task Force, the Governor, and the Tribes should actively support the inclusion of language in the proposed WRDA 1998 which would "add water quality protection, restoration and improvement as a stated purpose of the Central and Southern Florida Project".
  - 15. Regional, State and federal agencies, the Tribes, and local governments and the public should work to bring together existing water resource assessment efforts and identify critical water quality problems. Under the Clean Water Action Plan, local, regional, State, federal, and Tribal agencies, in cooperation with stakeholders, should develop unified watershed assessments which identify watersheds in need of restoration and water sheds that need preventative action to sustain water quality using ongoing State, federal, and Tribal programs.
  - 16. The Corps should ensure that all proposed modifications include sufficient water quality treatment components so as to meet all applicable State, local, Tribal and federal laws.

17. The Corps should seek improvements to the Initial Draft Plan that improve the water quality conditions in the natural areas of the ecosystem and that would contribute to better public health and safety in the built areas.
18. In the Restudy's Initial Draft Plan, a significant portion of freshwater flows to central and southern Biscayne Bay are supplied by the South Miami-Dade reuse component. However, due to significantly high construction, operation and maintenance costs, and potential water quality implications, the Corps should investigate all potential sources of water for providing freshwater flows to central and southern Biscayne Bay.

### **Water Quality Standards for WCAs, Everglades National Park and OFWs**

The Water Conservation Areas (WCAs) and Everglades National Park are both designated by the State of Florida as Class III water bodies - designating them for recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. State water quality standards require that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." In the federal lawsuit settlement agreement with the State and the SFWMD for failure to enforce State standards, different intermediate and long-term numeric phosphorus limits were established for the WCAs and Everglades National Park. Under the Everglades Forever Act (EFA): phosphorus limits were included in State law; research and monitoring activities were specified; and a time frame was set for adoption of the final numeric phosphorus standard for the Everglades (Dec. 31, 2003). The EFA also required that compliance with the new numeric phosphorus standard, and all other water quality standards, be achieved by December 31, 2006.

Everglades National Park, Big Cypress National Preserve, Biscayne National Park, and the Florida Keys National Marine Sanctuary are all designated as Outstanding Florida Waters (OFWs) and afforded "the highest protection". This allows, with a few exceptions, for a "no degradation of water quality" standard for these areas. Water quality standards for an OFW are based on non-degradation of the ambient water quality that existed during the year prior to designation (in most cases, no earlier than March 1, 1979). Until the water quality is established for this baseline year, exact numeric OFW standards are unknown. In recognition of the critical ecological condition of Florida Bay, it is imperative that a numeric salinity criterion for the Bay be developed by the DEP.

### **RECOMMENDATION**

19. DEP, in consultation with the U. S. Department of Interior, EPA, the National Oceanic and Atmospheric Administration, and the Florida Game and Fresh Water Fish Commission, should develop as soon as possible, appropriate numeric water quality standards for the OFWs of the Everglades National Park, Big Cypress National Preserve, Biscayne National Park, Florida Keys National Marine Sanctuary and for all other OFWs in the South Florida ecosystem, and a salinity criterion for Florida Bay, which is a part of Everglades National Park. All

information should be coordinated with the Restudy process to ensure future design efforts incorporate necessary water quality considerations.

### **WCA Stormwater Treatment Areas**

Construction of Stormwater Treatment Areas in the Everglades Agricultural Area and the western C-51 Basin is required by the Everglades Forever Act (EFA) and the Everglades Construction Project (ECP) Permit issued to the SFWMD by DEP. STA 1W is to be completed by January 1, 1999; STA 2 by February 1, 1999; STA 3/4 by October 1, 2003; STA 5 by January 1, 1999; and STA 6 by October 1, 1997. The final phosphorus criterion is to be met by December 31, 2006. The EFA does not specify treatment mechanisms for other areas that discharge to the Everglades. Those areas are covered by the Non-ECP Permit issued to the SFWMD by DEP. This permit requires the evaluation of existing programs, permits and water quality data; the development of schedules and strategies for achieving and maintaining water quality standards; and, among other things, the acquisition of land and construction and operation of water treatment facilities.

Objections have been raised about both the long period of time before the last STA becomes operational (October 1, 2004) and the date final phosphorus and other water quality standards must be achieved (December 31, 2006). The SFWMD does not believe it is possible to accelerate the STA construction schedule. They are also working to develop, as rapidly as practical, the supplemental technology necessary to meet the final phosphorus standards.

### **RECOMMENDATION**

20. The SFWMD should proceed as rapidly as possible to fulfill the requirements of the ECP, Non-ECP, and Corps Permits. As part of this effort, the Corps and SFWMD should fund and complete the S-9 Basin Critical Project. All information should be coordinated with the Restudy process to ensure future design efforts incorporate necessary water quality considerations.

### **Maintain Healthy Food Chain and Monitoring for Toxicity and Bio-accumulation**

In South Florida, numerous water quality problems abound that threaten the biota and food chain. For example, mercury contamination of the food chain in the Everglades is a serious problem – signs are often posted warning fishermen to limit their consumption for health purposes. Pesticide contamination has also been detected in several locations. Because sediments accumulate many types of pollutants, these pollutants are often transported to downstream locations as sediments are transported under high flow conditions. Sediments are also a source of pollutants that are transferred into the ecosystem's food chain through bioaccumulation and bio-magnification. Heavy metals, pesticides, and other pollutants have been measured in sediments in a number of locations. The Governor's Commission recognized the seriousness of this problem and included recommendations 28 and 29 specifically addressing these concerns in their *Initial Report* to the Governor.

## RECOMMENDATIONS

21. Appropriate federal, State, regional and local agencies should develop and undertake a study of selected plant and animal species that are key indicator components of the food chain to determine ecosystem health and the presence and bio-accumulation of any toxic substances. Sediment standards should be developed and problem areas addressed. All information should be incorporated into the Restudy process.
22. As a part of the detailed design, in compliance with federal laws and regulations, the Corps will test for contamination of material proposed to be used for construction and fill.
23. Within the water quality certification issued for construction of modifications to the C&SF Project, regulatory agencies should require copies of results of Corps testing for contamination for all material to be used for back-filling canals and creating wetlands.

### **Integrate Water Quality of C-111 and Modified Water Deliveries Projects with the Restudy**

Authorized C-111 and Modified Water Deliveries Projects currently exist. They were developed a number of years ago and may not address all current issues. As a result of the federal Settlement Agreement with the State, limits were established on the concentration and load of nutrients that could be discharged to Everglades National Park and the Loxahatchee National Wildlife Refuge. Regulatory agencies cannot permit discharges that would exceed these limits without violating the Settlement Agreement. Some of the projects' discharge points raise concerns since general designs were developed before the Corps included water quality as a project component.

A generally acceptable solution to the 8.5 square mile area problem is also lacking. Endangered species concerns were not completely addressed; and an agreement on the acceptability of the design for all project components was not reached, especially with the funding agency. A number of design modifications were proposed for both projects during the Restudy process. Some of those revisions address the issue of water quality. Although some funding exists, the projects have been delayed until a resolution of outstanding issues is achieved.

## RECOMMENDATION

24. All water quality considerations and components included in the Restudy should be integrated into the C-111 and Modified Water Deliveries Projects.

## **D. ASSURANCE TO WATER USERS**

Through March, April, and May 1998, many of the water users in South Florida addressed the Commission and raised several issues of concern about the C&SF Project Restudy. The Commission has discussed many of those topics, including assurance issues, and recognizes that final assurance language for some concerns cannot be developed until after the draft Comprehensive Plan for the C&SF Project Restudy is unveiled and reviewed during the fall of 1998. Many of the assurance issues may be adequately addressed in the Plan by its October release, and therefore, Commission discussions at this time regarding those issues may be premature. After the Plan's release, the Commission will revisit any remaining concerns relating to the provision of assurances to water users. However, in the interim, the Commission feels that the incorporation of the following preliminary assurance recommendations will strengthen the draft Comprehensive Plan and help build stakeholder support for the Restudy effort.

### **Protecting Current Levels of Service (Water Supply and Flood Protection) during the Transition from the Old to the New C&SF Project**

The goal of a sustainable South Florida is to have a healthy Everglades ecosystem that can coexist with a vibrant economy and quality communities. The current C&SF Project has generally provided most urban and agricultural water users with a level of water supply and flood protection adequate to satisfy their needs. In fact, if properly managed, enough water exists within the South Florida system to meet restoration and future water supply needs for the region. However, past water management activities in South Florida, geared predominantly toward satisfying urban and agricultural demands, have often ignored the many needs of the natural system (GCSSF, 1995; transmittal letter to Governor Chiles, p. 2). Specifically, water managers of the C&SF Project historically discharged vast amounts of water to tide to satisfy their mandate to provide flood protection for South Florida residents, oftentimes adversely impacting the region's estuarine communities.

The Commission recommended that in the Restudy, the SFWMD and the Corps should ensure that the redesign of the system allows for a resilient and healthy natural system (GCSSF, 1995; p. 51) and ensure an adequate water supply and flood protection for urban, natural, and agricultural needs (GCSSF, 1996a; p.14). In response to the need to restore South Florida's ecosystem, and in light of the expected future increase of urban and agricultural water demands, the Restudy aims to capture a large percentage of water wasted to tide or lost through evapotranspiration for use by both the built and natural systems. In order to maximize water storage, the Restudy intends to use a variety of technologies located throughout the South Florida region so that no one single area bears a disproportionate share of the storage burden. This direction reinforces the Commission's recommendation that water storage must be achieved in all areas of the South Florida system using every practical option (GCSSF, 1996a; p. 25). These storage alternatives include reservoirs, ASR, and wastewater reuse.

However, concerns have been expressed that a water user would be forced to rely on a new water storage technology before that technology is capable of fully providing a water supply source, and that the user would thereby experience a loss of their current legal water supply level of service. Any widespread use of a new technology certainly has potential limitations; however, the Restudy should address technical uncertainties prior to project authorization and resolve them before implementation in the new C&SF Project. With the addition of increased water storage capabilities, water managers will likely shift many current water users to different water sources.

The Commission recognizes that the SFWMD cannot transfer the Seminole Tribe of Florida from its current sources of water supply without first obtaining the Tribe's consent. This condition exists pursuant to the Seminole Tribe's Water Rights Compact, authorized by Federal (P.L. 100-228) and State Law (Section 285.165, Florida Statutes).

### RECOMMENDATION

25. In connection with the construction of alternative water storage facilities pursuant to the Restudy, the SFWMD should not transfer existing legal water users from their present sources of supply of water to such alternative facilities until the new facilities can reliably supply the existing legal uses. The SFWMD should implement full use of the capabilities of new systems, as they become operational, while continuing to provide legal water users as needed from current sources. It is the Commission's intent that existing legal water users be protected from the potential loss of existing levels of service resulting from the implementation of the Comprehensive Plan, to the extent permitted by law.

### **Balancing the Benefits between Stakeholders in the Implementation of the Comprehensive Plan**

The Comprehensive Plan will be formulated through a consensus-building process involving all of the different stakeholders in South Florida. Not only will there be input from federal, State, and local agencies, but there will be input from agricultural, urban, environmental, Tribal and citizen stakeholders. This initial input was based on stakeholder perception of the Restudy's plan at that time. With the release of the Restudy's Draft Report and Environmental Impact Statement (EIS) in October 1998, additional input, based on the Draft Report and the EIS, will be necessary from stakeholders. Indeed, the Comprehensive Plan is based on the *Conceptual Plan for the C&SF Project Restudy* unanimously agreed-upon by the Governor's Commission for a Sustainable South Florida, endorsed by the District Governing Board, and adopted by Governor Lawton Chiles in 1996.

To meet the needs of the different stakeholders, the Comprehensive Plan must strike a delicate balance between different interests and assure a sustainable South Florida ecosystem. It should balance federal, State and Tribal interests in water supply, flood protection, water quality, and environmental restoration. It should balance the needs of

different stakeholder groups, in particular, the needs of agriculture, urban areas, and the environment. These balances must be struck on a region-wide scale, with the plan providing for the different interests regionally even if the plan also addresses the needs of a particular interest to a greater or lesser degree in a specific locale.

Given the fact that the Comprehensive Plan must represent a balance of interests, it is important that the implementation of the Comprehensive Plan reinforce that balance. With a project this size, implementation will take ten to twenty years and occur in phases. Although the entire project, once completed, necessarily must be the balanced plan that has been developed through the Restudy process, there is a risk that during the plan's implementation, certain stakeholders will unduly benefit compared to others. A basic principle of the implementation should be that each phase implemented must continually reflect the balance of interests that make up the entire Comprehensive Plan. For instance, while the individual components of the plan will be multi-purpose, they may provide more benefits to a particular stakeholder group over another. It is important that each phase of implementation include components that provide a balance of benefits to different stakeholders to further the broad-based consensus that has supported the development of the Comprehensive Plan.

#### RECOMMENDATIONS

26. Subject to the principles of adaptive management, there should be an implementation plan that clearly outlines the timing and order of the C&SF Project modifications.
27. The SFWMD and the Corps should design the implementation plan so as to maintain the balance of benefits across all users and the natural system and to assure a sustainable South Florida ecosystem, including the natural systems existing in the urban areas where consistent with ecosystem restoration goals. Initial implementation should be directed to projects that ensure benefits consistent with WRDA '96 and the Commission's Conceptual Plan for the Restudy.

#### **Providing for Continued Opportunities for Public Input and Adaptive Management**

During the collection of detailed technical information and/or implementation of components of the Restudy, the performance of a component may not meet expectations or may result in unintended and harmful consequences. In such events, the Corps may then reconsider the use or continued implementation of such a component. Additionally, the completion of the Restudy will likely take twenty years and will require the continued support of the federal, State, Tribal and local governments and the citizenry of South Florida.

## RECOMMENDATION

28. The Corps should clearly articulate in the Comprehensive Plan for the C&SF Project Restudy opportunities for continued public input and adaptive management in the Restudy process following authorization.

## **E. THE ROLE OF THE RESTUDY IN WATER SUPPLY LEVEL OF SERVICE**

### **Maintaining a Reliable Water Supply Level of Service**

Chapter 373.0361(2)(a), Florida Statutes, requires water management districts to develop regional water supply plans which include a water supply development component that provides a level of certainty planning goal for meeting existing and future reasonable beneficial needs based on a 1-in-10 year drought event. This planning goal is a state law requirement, and thus a water management district obligation. It does not impose a legal obligation on the Restudy. However, this goal should be addressed by the Restudy to the extent possible because the SFWMD is the local sponsor of the Restudy.

The availability of the 1-in-10 drought year level-of-certainty from the regional system is a subject of the Restudy project. The Restudy has adopted and is using a performance measure for a 1-in-10 year level-of-certainty that was jointly developed by the SFWMD, utility, and agricultural representatives. The use of this performance measure by the Restudy is appropriate, although it is one of many, sometimes competing, performance measures used in the Restudy. This performance measure is a tool to evaluate how well the Restudy is meeting water supply objectives, but is not a requirement that by itself determines the success of the Restudy. The Restudy should attempt to maximize all performance measures. To facilitate accomplishment of this goal, the Restudy should promote aggressive water conservation measures.

### **RECOMMENDATION**

29. The Restudy represents an opportunity for joint federal/local sponsor achievement of project purposes contained in the WRDA 1996. To ensure maximum utilization of this opportunity, the SFWMD, which must legally meet the requirements of 373.0361, Florida Statutes, should, as a local sponsor, ensure that the Restudy makes every effort, consistent with WRDA 1996, to attain a 1-in-10 level-of-certainty in water supply. The SFWMD may sponsor a Restudy that does not meet the 1-in-10 year level-of-certainty planning goal; however, where this cannot be achieved, the SFWMD should acknowledge its obligation under state law to: a) take the lead in identifying, implementing and securing funding for water resource development projects; and b) identify options in the regional water supply plans to meet the 1-in-10 level-of-certainty planning goal.

## F. SOUTHWEST FLORIDA ISSUES

### Southwest Issues and the C&SF Restudy

#### *Caloosahatchee River*

Although prehistoric cultures may have been the first to attempt to alter the Caloosahatchee River (Luer, 1989); it was Hamilton Disston in the early 1880's who first began dredging the Caloosahatchee River for purposes of drainage for agriculture and development. Eighty years of modifications would follow, with the final modification occurring in 1969 with the construction of the Olga Locks. Before dredging, the river originated in the marshlands of Lake Flirt, west of Lake Okeechobee and meandered slowly from the marshes west of Lake Okeechobee, spilling over falls and wandering slowly through a series of oxbows before emptying into the Gulf of Mexico. Between the headwaters of the River and Lake Okeechobee were two small lakes, Lettuce and Bonnett, and the slightly larger Lake Hicpochee, connected only by a marshy grassland leading to the remnants of an Indian canoe trail that joined Hicpochee to Okeechobee (Kimes and Crocker, 1998).

The Caloosahatchee River watershed now extends approximately 70 miles from Lake Okeechobee to San Carlos Bay and includes portions of Lee, Collier, Hendry, Glades and Charlotte counties. Inflows from Lake Okeechobee and runoff from within its own basin supply the river. The major freshwater tributaries are the Orange River in addition to Telegraph, Hickey, Bedman, Trout, Popash, Hancock, Cypress, Spanish, Fichter and Dougherty Creeks; Jack's and Ft. Simmons Branches, and flow is supplemented by numerous canals including Crawford, Townsend and Roberts Canals. The freshwater portion of the River, (having been reconfigured as the C-43 Canal) extends eastward approximately 45 miles, from the Franklin Lock and Dam (S-79) towards Lake Okeechobee past the town of LaBelle and ending at the Moore Haven Lock and Dam (S-77). West of the Franklin Lock and Dam, the River mixes freely with the estuarine water as it empties into the Gulf of Mexico just southeast of the Island of Sanibel. Water quality from upstream of the Franklin Lock and Dam to the Hendry/Lee County border, is designated as a Class I drinking water source by DEP.

The Caloosahatchee River is currently the major surface water source of water supply for the Lower West Coast region of the District. In 1990, 24.4% (or 9.56 MGD) of the total public water supply for Lee County came from the Caloosahatchee River (SFWMD, 1994; p. II-3). Lake Okeechobee and the Caloosahatchee River are the sources of water for much of northern Hendry County as well. The Caloosahatchee River is characterized as:

*"heavily allocated: nearly every landowner along its banks is permitted to withdraw water for agricultural irrigation. Ft. Myers uses the water to recharge its water table wellfield, and Lee County treats and distributes river water directly for public water supply. Homeowners in Ft. Myers also use the water to irrigate their lawns." (SFWMD, 1995b; p. II-166).*

The River also provides irrigation water for agriculture within the basins and public water supply for the City of Ft. Myers the community of Olga, and parts of Lee County.

The Caloosahatchee River is part of the Lake Okeechobee Waterway that provides navigation between Florida's East Coast and the gulf coast. There are three structures (S-77, S-78 and S-79) which provide for navigation and water control in the River. Water levels upstream of S-78 are maintained at approximately 11 feet national geodetic vertical datum (NGVD) and 3 feet downstream. In the eastern section of the River, Lake Hicpochee was severely impacted by the construction of the C-43 Canal, as the canal was constructed through the lake's center, which resulted in lower lake water levels. The Franklin Lock and Dam also serves as a saltwater barrier to protect drinking water intakes for Lee County utilities (SFWMD, 1994).

The Caloosahatchee provides drainage for numerous private drainage systems and local drainage districts within the combined drainage basins. A primary purpose of the canal is to provide for regulatory releases of excess water from Lake Okeechobee. The operation of these water levels is dependent on rainfall conditions, agricultural practices, the need for regulatory releases from Lake Okeechobee, and the need to provide water quality control for the public water supply facilities (SFWMD, 1983).

These highly fluctuating freshwater inputs from Lake Okeechobee and poor water quality are harming the Caloosahatchee estuary:

*"Alterations of freshwater flow and poor water quality are the key environmental issues in the Caloosahatchee River Estuary. Lake Okeechobee regulatory releases and uncontrolled runoff from the Caloosahatchee River sub-basins can result in too much fresh water entering the estuary too frequently causing wide salinity variations that destroy estuarine communities. At the other extreme, during low flow conditions, too little water may be available. These low flow conditions allow saline water to migrate upstream threatening Lee County Utilities drinking water intake. Poor water quality also threatens the estuarine communities." (SFWMD, 1995a; p. I-167)*

Water quality within the River is generally good, although low macro-invertebrate biotic indices suggest some dissolved oxygen problems and/or habitat reduction problems exist within the system. The most likely causes are water quality degradation caused by agricultural and urban runoff and the influence of nutrient enriched water from Lake Okeechobee. In the Caloosahatchee Estuary itself, elevated nutrient concentrations have been identified.

The Caloosahatchee River is the only portion of the C&SF Project that resides in Southwest Florida. Because of this, the development of the Comprehensive Plan for the Restudy is currently only assessing Southwest issues as they relate to the Caloosahatchee Basin.

Specific items being investigated in the Restudy include (Alternative 5):

- a. Changing the operational target flow at S-79 in order to support desired estuary environmental values and also to reduce the volume of flows required from the Caloosahatchee basin storage reservoir and Lake Okeechobee.
- b. Devising and modifying operation of storage reservoir(s) in the C-43 basin so that it operates in conjunction with the Caloosahatchee Backpumping Facility that captures excess basin runoff that will be used to increase the regional water resources.
- c. Development of storage reservoir (20,000 acres at 8' max. depth) with ASR (22, 10 MGD wells) in the Caloosahatchee basin. Purpose: to capture basin runoff and regulatory releases from Lake Okeechobee to provide water supply benefits, some flood attenuation and environmental water supply deliveries to the Caloosahatchee Estuary. Operated in conjunction with (g) below.
- d. Environmental water supply deliveries to the Caloosahatchee Estuary (operational change only). Purpose: to provide freshwater deliveries to the Caloosahatchee Estuary to establish desirable salinity at locations of key estuarine biota. Operational target flow at S-79 revised.
- e. Current lake Okeechobee Regulation Schedule (elimination of all except Zone A {emergency} regulatory releases to the St. Lucie and the Caloosahatchee Estuaries). Purpose: to implement operating criteria for Lake Okeechobee that includes flood control, water supply (including releases to the WCA's to meet estimated natural system needs) as well as lake littoral zone and estuary protection.
- f. Lake Okeechobee ASR (100, 10 MGD wells) along the lake peripheral levee. Purpose: utilize climate based operational rules for the ASR wells to provide additional regional storage while reducing both evapotranspiration losses and the amount of land removed from current land use (e.g. agriculture) that would normally be associated with construction and operation of above-ground storage facilities (reservoirs); increase the Lake's water storage capability to better meet regional water supply demands for agriculture, Lower East Coast urban areas, and the Everglades; manage a portion of regulatory releases from the Lake primarily to improve Everglades hydropatterns, meet environmental targets within the WCAs, and meet supplemental water supply demands of the Lower East Coast; reduce harmful regulatory discharges to the St. Lucie and Caloosahatchee Estuaries; and maintain existing level of flood protection.
- g. Caloosahatchee Backpumping with Stormwater Treatment Area. Purpose: to increase the regional water resources by capturing excess C-43 basin runoff and diverting it into Lake Okeechobee after treatment through a stormwater treatment area.

Specific Restudy performance measures for the Caloosahatchee Estuary include:

- 300 cfs: Minimum average monthly flow required to maintain acceptable estuarine salinity ranges
- 2800 cfs: Favorable maximum mean monthly flow that provides suitable salinity conditions for the development of important benthic communities (oysters, shoalgrass)
- 4500 cfs: Mean monthly flows above which freshwater conditions throughout the estuary cause severe impacts to estuarine biota

#### *Eastern Hendry County*

The SFWMD undertook works involving flood control and water management in eastern Hendry County. Several canals were begun in order to open lands for agricultural operations, including sugar cane and row crops.

Legal action terminated the expansion and completion of the SFWMD works in Hendry County in the early 1980s. The current status of these works is that they were agricultural operations, and are subject to the various settlement agreements affecting Everglades restoration. However, the end result is that some portions of Hendry County's water resources are transported in directions contrary to the original hydrological system.

#### *The Need for Additional Investigations*

In 1994, the Corps completed the reconnaissance phase of the Restudy. That stage set forth restoration issues and alternative plans for consideration by local communities and participating agencies. That phase determined the problems and opportunities to develop a plan or plans that could be implementable – to determine if further studies are warranted. Following that phase, the feasibility stage was begun which would set the stage for the selection of a preferred alternative as the benchmark for a full feasibility study. A feasibility phase results in a report to Congress that describes and justifies the features of a recommended project. This is presented to Congress for Congressional authorization to construct a project(s). Feasibility studies are cost-shared with the project sponsor whom contributes 50% of the study effort as cash and in-kind services. The end product of the study is a report that contains the appropriate National Environmental Policy Act documentation, often an Environmental Impact Statement, with a level of detail sufficient to support a decision by Congress to construct the project(s).

#### *Problem Statement*

The Southwest region of the State has been growing at rapid rates in the past decades and its current pace is only accelerating. As growth increases, the accompanying infrastructure (water supply, flood control, sewage etc.) will also be needed. The C&SF Project and its "Restudy" do not cover most of the Southwest region. Hence only a small portion of the region (the Caloosahatchee Basin) is currently being evaluated as part of the

Restudy. The Restudy itself is a remedial study, looking at how to fix and improve the current C&SF system. It is not looking at how to plan for and manage the Southwest region that is now at the threshold of extreme growth pressures and intensified development.

Because the Southwest region has either been ignored in water planning or has been seen as an adjunct or isolated region requiring little attention, it suffers from lack of data and analyses and tends to be seen as an afterthought in the overall resource planning and management of the greater Everglades ecosystem. As an example, the Caloosahatchee River was made a drainage conduit for the larger Everglades region, and for cross-Florida navigation purposes. Because of its linkages to Lake Okeechobee and the water supply/flood control needs of the entire South Florida region, the Caloosahatchee Basin has not had the benefits of being studied for its own regional merits, both in the counties in which it resides, nor for its total contribution to the greater Southwest region at large. Recently however, "awareness of the River as an essential, not tangential, element in a larger, interrelated system has brought the Caloosahatchee and its watershed into the restoration plans for the entire South Florida ecosystem" (Kimes and Crocker, 1998). However, the Caloosahatchee River is but one hydrologic unit of the greater Southwest region.

As the entire Southwest region continues to experience rapid growth and development, an opportunity exists to utilize the "feasibility" assets of the Corps in planning for proper infrastructure before or as intense development occurs, not after. A feasibility study would allow an evaluation of needs, problems, potential solutions and identification of opportunities for Federal participation commensurate with other regions within Florida and the nation. It would also more equitably address total and limited geographic problems which currently arise, as for example, in the context of the Restudy. For instance, how will the projected effects of the Restudy be measured in the Southwest region if no primary fundamental data is present to mark its "pre-Restudy" condition? Such an investment would help preserve the natural assets of the region, while taking care of the water supply and flood control requirements. Because nothing like the C&SF system exists in the Southwest region, the opportunity to do it right the first time and not have to do a "Restudy" is appealing. With the potential for the 50% cost share, it is an opportunity that should not be passed by.

Primary water quality and hydrologic data does not exist for much of the region and a feasibility study would begin to fill in this critical gap. This important lack of primary information, assessments and monitoring data is a fundamental gap which greatly hinders long-term water resources management opportunities and places the Southwest region at risk in the evaluation of total system-wide effects of hydrologic modifications. Data ranging from geologic configuration, ecological conditions and basic water quality data to how to re-establish historic water retention patterns, and understanding the interrelationships between inland uses and the estuary, near shore and marine waters, on a regional scale have not been undertaken in a holistic, systematic manner.

Because only the Caloosahatchee Basin is included in the initial phase of the Restudy, there has been no preliminary reconnaissance or feasibility study done for the

entire Southwest region, as was done for the lower Southeast coast and other parts of South Florida. The hydrologic needs of the Southwest region are not being investigated for improvements at the same level of detail or at the same speed and this loss of primary information jeopardizes the long-term potential for wise use and management decisions both within the Southwest region and how it relates to the greater Everglades ecosystem at large. The entire Southwest region merits similar intensity of research and data collection.

### RECOMMENDATIONS

30. Southwest Florida Feasibility Study – The Corps should continue to review the authorized Central and Southern Florida Project including the recommendations of the Restudy and other pertinent reports to develop a comprehensive data base and water resources plan for the entire area of Southwest Florida, including Lee, Collier, Charlotte, Henry and Glades Counties. This study would provide for ecosystem and marine/estuary restoration and protection, environmental quality, flood protection, water supply, and other purposes. The study should provide a framework for achieving the following objectives and should also include applicable measurable performance measures:
  - a. Monitor and evaluate biological, chemical and hydrological indicators of healthy and productive river and estuarine systems.
  - b. Improve quality, quantity, timing and duration of water flows. Such improvements shall be realized through greater emphases on the integrity of system-wide analyses that link riverine, estuarine and marine research to Lake Okeechobee releases with other land use/flood control, water supply and stormwater drainage efforts.
  - c. Manage and maintain healthy wildlife, biological diversity and natural habitat. Identify and monitor key biological indices.
  - d. Establish and meet minimum and maximum water flows to maintain a healthy natural system, and protect water supply as mandated by Florida Statutes.
  - e. Enhance the regions economic viability, vitality and social diversity by ensuring overall economic net benefits through wise and informed natural resource management decision-making.
  - f. Ensure protection of individual property rights.
  - g. Preserve existing legal municipal, industrial, and agricultural water supplies and sources until reliable alternatives are made available.
  - h. Incorporate Tribal interests and concerns.
  - i. Develop and maintain pro-active and diverse citizen involvement and commitment. This would include improved public outreach and education activities throughout the broad range of Southwest Florida citizenry and visitors.
  - j. Link with efforts to refine and streamline the federal, state, regional and local permit processes so as to generate improved efficiency, effectiveness and certainty.
  - k. Preserve significant regional historical and cultural resources of the region.

- l. Utilize "non-structural or passive" flowways and other hydrological alternatives, where feasible.
  - m. Maximize flexible use of lands (multi-purpose uses) to maximize regional benefits including hydrologic, natural and economic.
  - n. Improve or maintain flood control from a basin-wide or region-wide scale.
  - o. Ensure consistency with adopted Local Government Comprehensive Plans, water management plans, projected population for the region and other regional or resource-based planning initiatives.
  - p. Improve water quality to meet State and federal water quality standards and to improve the overall physical, biological and aesthetic values of the region.
  - q. Enhance community understanding of the critical interdependence of the environment and the economy.
  - r. Protect the water quality resources of Big Cypress National Preserve.
31. Authorization should be obtained to accelerate land acquisition from willing sellers and build a demonstration project for water storage in the Lake Okeechobee Service Area, including the Caloosahatchee and St. Lucie basins. This should be pursued in accordance with the alternatives being considered by the Restudy and consistent with the 13 thematic concepts of the Conceptual Plan. The Demonstration Project would focus on acquisition of lands from willing sellers in order to expedite water storage and restoration activities.
32. Through more detailed design and through operational schedules, the Corps should continue to refine the Initial Draft Plan to achieve zero damaging discharges to the Caloosahatchee and the St. Lucie Estuaries without adverse impacts to other areas of the Restudy. Where discharges are unavoidable, damage should be shared equally.

## G. COORDINATION OF ACTIVITIES

### Optimizing Coordination of Proposed or On-going Studies with the Restudy

Many proposed or on-going projects already exist in South Florida that directly link to, and therefore potentially impact, the Restudy. These projects address a variety of issues, including water quality, water storage, habitat restoration, hydrological modeling, land acquisition, and geology; as well as physical, chemical, and biologic processes. The Governor's Commission developed a matrix (Appendix 2) that identifies many of these projects and their existing level of coordination with the Restudy. Correspondingly, gaps are identified where linkages need to occur.

Because the Restudy will be implemented over the next twenty years, this matrix should continue to be updated, and will serve as an important tool in the continued monitoring and coordination of on-going projects with the Restudy. Efficient coordination between these on-going projects and the Restudy should prove highly beneficial over the long term by minimizing duplicative efforts and ensuring compatibility of project planning and implementation.

### RECOMMENDATIONS

33. The South Florida Ecosystem Restoration Task Force should ensure that proposed and on-going projects related to the Restudy are monitored, and coordinated with the Restudy, to ensure efficiency, eliminate duplication of effort, and ensure efficient use of State and federal funds.
34. The Governor's Commission for a Sustainable South Florida should continue to advise the Task Force consistent with WRDA '96.
35. Congress and the Florida Legislature should develop a partnership for authorizing, implementing, and supporting the C&SF Project Restudy.

## **H. INTERIM CONCLUSIONS ON THE RESTUDY**

At this point in the Restudy process, the Commission finds that the key components of the Restudy's Initial Draft Plan, as presented to the Commission, are generally consistent with the Conceptual Plan for the C&SF Restudy. The aforementioned recommendations are hereby transmitted to assist the Corps and the SFWMD in improving the draft Comprehensive Plan that will be completed by October 1998. We wish to re-emphasize that these concerns should be addressed in the October Report. The Commission looks forward to assisting the Corps and the SFWMD in the Restudy effort, by providing additional review, dialogue and comment on the October 1998 draft Comprehensive Plan and will continue to assist this important process however needed.

## GLOSSARY

**Adaptive Management:** A structured, iterative approach that recognizes that the information used in making decisions is imperfect and that, as decisions are made, a process is in place to gain better information and adjust the implemented action accordingly.

**Aquifer:** A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield useful quantities of groundwater to wells, springs or surface water.

**Aquifer Storage and Recovery (ASR):** The injection of freshwater into a confined saline aquifer during times when supply exceeds demand (wet season), and recovering it during times when there is a supply deficit (dry season).

**Backpumping:** The practice of pumping water that is leaving an area back into a surface water reservoir.

**Best Management Practices (BMPs):** Agriculture and other industry management activities designed to achieve an important goal, such as reducing farm runoff or optimizing water use.

**Brackish:** Water with a chloride level greater than 250mg/l and less 19,000 mg/l.

**Control Structures:** A man-made structure designed to regulate the level and/or flow of water in a canal (e.g., weirs, dams).

**Cost Effective:** The minimum cost within defined limits of performance and/or quality standards, for example, a cost effective public water supply would provide water meeting U.S. EPA drinking water standards and public preferences for taste, color, and hardness and within a range of acceptable water pressure and some defined service reliability criterion.

**Development:** Usually urban development, but can encompass any form of human-induced changes to the natural landscape.

**Ecosystem:** A community of organisms, including humans, interacting with one another and the environment in which they live.

**Ecosystem Management:** An integrated, flexible approach to management of biological and physical environments--conducted through the use of tools such as planning, land acquisition, environmental education, regulation, and pollution prevention--designed to maintain, protect, and improve the natural, managed, and human communities.

**Evaporation:** The process by which water is changed from liquid to vapor.

**Evapotranspiration:** The loss of water to the atmosphere by evaporation from land and water surfaces and transpiration from plants.

**Everglades:** South Florida's huge, interior freshwater marsh variously dotted with "islands" of trees.

**Everglades Agricultural Area:** The area of histosols (muck) predominantly to the southeast of Lake Okeechobee used for agricultural production.

**Everglades Ecosystem:** A water dominated hydrologic unit beginning in the interconnected lakes and marshes of central Florida and extending downstream through the Kissimmee River system, Lake Okeechobee, the Everglades, Big Cypress Swamp, and into the estuaries of the Ten Thousand Islands, Biscayne Bay, Caloosahatchee Estuary, Indian River Lagoon, Florida Bay and through the Florida Keys.

**Everglades System:** A number of interrelated environments found in South Florida including freshwater marshes; wetland tree islands (broad-leaf types); cypress heads, domes, and dwarf cypress forests; tropical hardwood hammocks; pinelands; mangrove swamps and mangrove islands; coastal saline flats, prairies, and forests; tidal creeks and bays; shallow coastal marine waters; pond apple swamp (around the south and southeast shore of Lake Okeechobee); and cypress swamps (a narrow band along the eastern edge of Palm Beach and Broward counties). \* the latter two categories no longer exist.

**Groundwater:** Water beneath the surface of the ground, whether or not flowing through known and definite channels.

**Growth:** Expansion or increase in scale, magnitude, or physical dimensions.

**Human System:** Any part of the natural system modified structurally for human economic or residential uses.

**Hydropattern:** The full range of hydrologic parameters known as hydropattern, which includes the depth of water, duration of inundation, and the timing and distribution of fresh water flow. Hydropattern encompasses the more commonly used word "hydroperiod," which is the area's annual period of inundation.

**Hydroperiod:** The frequency and duration of inundation or saturation of an ecosystem. In the context of characterizing wetlands, the term hydroperiod describes that length of time during the year in which the substrate is either saturated or covered with water.

**Irrigation:** The application of water by artificial means. The goals of irrigation include, but are not limited to, supplying evapotranspiration needs, field preparation, freeze protection, crop cooling, and leaching of salts.

**Long Hydroperiod:** A long hydroperiod (relative to the Everglades) is a hydroperiod in excess of 10 months (often with continuous flooding for a few years).

**Levee:** An embankment to prevent flooding, or a continuous dike or ridge for confining the irrigation areas of land to be flooded.

**Natural System:** A self-sustaining living system that supports an interdependent network of aquatic, wetland-dependent, and upland living resources.

**Project Study Plan:** The plan of study which is used to define and manage the development and conduct of a feasibility study conducted by the Corps. The PSP documents the assumptions, work tasks, products, and the level of detail that will be necessary during the feasibility study to determine the existing and the future "without project" conditions; formulate a range of alternatives; assess their effects; and present a clear rationale for the selection of water resource development plan(s). The PSP includes the baseline cost, schedule, and assignment of responsibilities for the study.

**Reasonable-Beneficial Use:** The use of water in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner both reasonable and consistent with the public interest.

**Reclaimed Water:** Water that has received at least secondary treatment and is reused after flowing out of a wastewater treatment facility.

**Reservoir:** A manmade or natural lake where water is stored.

**Resilience:** The ability of a natural system to recover from or adapt to the stresses being placed upon it.

**Restoration:** To recover the natural system's vitality and biological and hydrologic integrity in such a way that the stated levels of health and ecological function are maintained over time.

**Reuse:** The deliberate application of reclaimed water, in compliance with DEP and Water Management District rules, for a beneficial purpose.

**Saline Water:** Water with a chloride concentration greater than 250 mg/l. The term saline water includes brackish water and seawater.

**Seawater:** Water which has a chloride concentration equal to or greater than 19,000 mg/l.

**Slough:** A channel in which water moves sluggishly, or a place of deep muck, mud, or mire. Sloughs are wetland habitats that serve as channels for water draining off surrounding uplands and/or wetlands. Sloughs can vary widely in size, but are normally long and narrow and positioned lower in the landscape. Depending upon the adjacent habitats, sloughs can exhibit temporary to almost permanent water regimes. Due to this large range of hydroperiods, plant species can vary widely from spike rushes and various aquatic species in the wetter areas to beak rushes, low panicums, and yellow-eyed grass in the less frequently flooded communities.

**South Florida Ecosystem:** A community of organisms, including humans, inhabiting the area stretching from the Kissimmee River Basin - Lake Okeechobee region to the coral reefs in the Atlantic Ocean and from the Caloosahatchee to the St. Lucie Estuaries. The area includes components of the environment, economy and society found in all or part of 16 counties, including the natural systems of the Kissimmee River Basin, Lake Okeechobee, the Everglades, Big Cypress Swamp, Florida Bay, Biscayne Bay, the Florida Keys reef tract, Charlotte Harbor, and Indian River Lagoon; over 5 million human inhabitants and the tourist meccas surrounding Orlando, such as Disney World; the Everglades Agricultural Area (EAA) south of Lake Okeechobee; small rural towns such as Pahokee, LaBelle, and Belle Glade; and urban centers such as Fort Myers on the west coast and the cities on the southeast coast stretching from Fort Pierce to Key West.

**Stormwater:** Surface water resulting from rainfall that does not percolate into the ground or evaporate.

**Subsidence:** Lowering of the soil level caused by the shrinkage of organic layers. This shrinkage is due to desiccation, consolidation, and biological oxidation.

**Surface Water:** Water upon the surface of the earth, whether contained naturally or artificially. Water from natural springs is classified as surface water when it exits from the spring onto the earth's surface.

**Sustainability:** The state of having met the needs of the present without endangering the ability of future generations to be able to meet their own needs.

**Sustainable Agriculture:** An integrated system of plant and animal production practices, having site specific application that will, over the long term, satisfy human food and fiber needs, enhance environmental quality and the natural resource base upon which the agricultural economy depends, making the most efficient use of non-renewable resources and on-farm resources, and integrate where appropriate natural biological cycles and controls, sustain the economic viability of farm operations and enhance the quality of life for farmers and society as a whole.

**Urban Development:** The human landscape characterized by cities, towns, suburbs, and outlying areas typically commercial, residential, and industrial in nature. They are typically non-agricultural or non-rural in nature.

**Water Conservation Areas (WCAs):** That part of the original Everglades ecosystem that is now diked and hydrologically controlled by people for flood control and water supply purposes. These are located in the western portions of Miami-Dade, Broward, and Palm Beach Counties, and comprise a total of 1,337 square miles.

**Water Control Structure:** A barrier that acts to hold water at a planned level.

**Water Table:** That surface of a body of unconfined groundwater at which the pressure is equal to the atmosphere; defined by the level at which water within an unconfined aquifer stands in a well that penetrates the aquifer far enough to hold standing water.

**Water Use:** Any utilization of water that reduces the supply from which it is withdrawn or diverted.

**Wastewater:** The combination of liquid and water-carried pollutants from residences, commercial buildings, industrial plants, and institutions together with any groundwater, surface runoff or leachate that may be present.

**Wetlands:** Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do or would support a prevalence of vegetative or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction. These include swamps, marshes, bayheads, cypress ponds, sloughs, wet prairies, wet meadows, river overflows, mudflats, and natural ponds.



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## APPENDIX I: RESTUDY ISSUE TEAMS

**PURPOSE:** The GCSSF has been recognized by Congress as an advisory body to the South Florida Ecosystem Restoration Task Force. The GCSSF will be giving the Task Force recommendations on the Restudy's Comprehensive Plan by July, 1998. These recommendations will be based on the GCSSF's August 1996 Conceptual Plan and the commission's consideration of major stakeholder's input presented to the commission during March-May, 1998.

**PROCESS:** The GCSSF has currently formed eight "Restudy Issue Teams" to address the restudy. Each team is made up of members of the GCSSF, staffed by agency staffs, and meeting by phone each week (on Fridays) to develop Restudy recommendations. Once a recommendation is "ripe", it is brought back for consensus buy-in by the full Commission. "Consensus" requires at least a 2/3 favorable vote of all members present and voting. The following process was used:

**MAY, 1998:**

- Issue Teams met throughout month "to develop" draft recommendations
- GSSF MEETING: May 28-29 - 2<sup>nd</sup> Plenary review & Ranking of Draft Reports and recommendations

**JUNE, 1998:**

- Issue Teams met "to refine" draft recommendations
- GCSSF MEETING: June 25-26 - 3<sup>rd</sup> Plenary review & ranking of draft recommendations

**JULY, 1998:**

- Final Drafts Due from Issue Teams by July 3<sup>rd</sup>
- A single text with all recommendations mailed to members by July 7<sup>th</sup>, with amendment forms for members to make proposed amendments
- Amendments forms due back by July 16<sup>th</sup>
- Amendment packet mailed out July 18<sup>th</sup>
- GCSSF MEETING: July 23-24 - FINAL AMENDATORY ROUND, CONSENSUS BUILDING AND ADOPTION OF REPORT TO TASK FORCE.

**CURRENT "EIGHT" RESTUDY ISSUE TEAMS:** The following are the memberships (including specially invited participants), and the starting charges given to these teams:

- **TEAM 1: Assurance to Water User** - The goal of this team is to draft a recommendation(s) that, if implemented, would assure water users that they will not experience a loss of water supply or flood protection during the transition from the current C&SF Project to the one outlined in the final Comprehensive Plan. In addition, the team will develop any other recommendations to alleviate stakeholder concerns about the implementation of the restudy.

- **MEMBERS:** Rock Salt/Co-Chair, Bubba Wade/Co-Chair, Mitchell Berger, Sen. Howard Forman, Debra Harrison, Dexter Lehtinen, Jack London, Richard Pettigrew, Rep. John Rayson, Steve Shiver, and Charles Zwick.
  - **STAFF:** Webb Smith (GCSSF).
  
- **TEAM 2: Level of Service** - The goal of this team is to review HB-715 and the restudy performance measures being utilized, to determine the extent to which the restudy will satisfy the goals of HB-715, and to determine the extent to which other complementary measures may be required. In addition, the team should determine the current levels of service for agriculture and urban users.
  - **MEMBERS:** Chuck Aller/Co-Chair, Ernie Barnett/Co-Chair, Maggy Hurchalla, Dexter Lehtinen, Janet Llewellyn (DEP), Phil Parsons (U.S. Sugar), Roy Reynolds (Broward County Utilities), Shannon Estenoz (WWF).
    - **STAFF:** John Outland (DEP).
  
- **TEAM 3: Water Storage** - The goals of this team are to determine: whether the Restudy's comprehensive plan will be jeopardized by the underperformance of Aquifer Storage and Recovery (ASR) and/or Reservoirs; the level and risk of shortages to water users in such an instance, and the existence of contingency plans within the Comprehensive Plan in case of an underperformance. Upon review of this information, the team will draft necessary recommendations.
  - **MEMBERS:** John Flanigan/Co-Chair, Stuart Strahl/Co-Chair, Luis Ajamil., Ernie Caldwell, Miguel Diaz de la Portilla, Bill Dover, Gary Evink, Quinton Hedgepeth, Lori Nance Parrish, Bill Payne, Carol Rist Tom MacVicar.
    - **STAFF:** Henry Bittaker (SFWMD), Paul Darst (DCA), Richard Punnett (ACOE).
  
- **TEAM 4: Land Procurement; Connectivity within the Everglades Ecosystem** - The goal of this team is to review the previous works of the Commission and compile language that illustrates its consensus approaches toward land procurement. In addition, this team will address state and federal eminent domain issues and determine whether the connectivity objectives highlighted in the Conceptual Plan have been satisfactorily met in the Restudy.
  - **MEMBERS:** John DeGrove/Co-Chair, Jack Moller/Co-Chair, Mitchell Berger, Loly Espino, John Flanigan, Dexter Lehtinen, Noble Hendrix, Col. Joe Miller, Stuart Strahl, and Michele Thomas.
    - **STAFF:** Nanciann Regalado (SFWMD), Henry Bittaker (SFWMD), Roberto Torres (GCSSF)

- **TEAM 5: Water Quality and Coastal and Estuarine Communities -**  
The goals of this team are to evaluate the extent to which water quality objectives in the Conceptual Plan are being met and the extent to which damage to the coastal and estuarine communities is being resolved in the Restudy.
  - **MEMBERS:** Mike Collins/Co-Chair, Art Darling/Co-Chair, Ernie Barnett, Billy Causey, Richard Harvey, Maggie Megee, Phil Parsons (U.S. Sugar), Terry Rice, Clara Williams.
    - **STAFF:** Herb Zebuth (DEP)
  
- **TEAM 6: Southwest Florida -** The goals of this team are to develop recommendations on how southwest issues, such as southwest water planning, critical projects in the Southwest area, the Southwest EIS, and other area planning should be coordinated with and complement the restudy.
  - **MEMBERS:** Robert Duane/Co-Chair, Pam MacKie/Co-Chair, Richard Bashaw, Ernie Caldwell, Col. Joe Miller, Bernie Yokel.
    - **STAFF:** David Burr (SWFRPC), Bonnie Kranzer (GCSSF/SFWMD)
  
- **TEAM 7: Coordination of Ongoing Studies -** The goal of this team is to make recommendations on how other ongoing studies, such as the Homestead Airforce Base Reuse Plan and Supplemental EIS, the Southwest EIS, the Lakebelt, the Multi-Species Recovery Plan, should be coordinated with the Restudy
  - **MEMBERS:** Richard Ring/Co-Chair, Roy Rogers/Co-Chair, John Anderson, John DeGrove, Mark Kraus (NAS), Col. Joe Miller, Jim Murley, Bill Payne, Steve Shiver, and Charles Zwick.
    - **STAFF:** Roberto Torres (GCSSF)
  
- **TEAM 8: Modified Water Deliveries -** The goal of this task team is to accelerate the implementation of the Modified Water Deliveries Project. This project is being implemented in conjunction with acquisition of 109,578 acres in the east Everglades as part of the Everglades National Park expansion. When completed, the project will restore historical hydroperiods in the southern portion of Water Conservation Area 3A and 3B, as well as the northern section of Shark River Slough, a total of about 800 square miles (excerpt from Integrated Financial Plan, March 1998)
  - **MEMBERS:** Noble Hendrix/Co-Chair, Dexter Lehtinen /Co-Chair, Mitchell Berger, Miguel Diaz de la Portilla, Loly Espino, Shannon Estenoz (WWF), Quinton Hedgepeth, Col. Joe Miller, Terry Rice, Richard Ring, Rock Salt, Stuart Strahl, Charles Zwick.
    - **STAFF:** John Outland (DEP)



## APPENDIX II: COORDINATION MATRIX

### Coordination: Proposed or On-going Projects Related to Restudy

This matrix was developed using the 1998 Integrated Financial Plan (IFP) developed by the South Florida Ecosystem Restoration Task Force. Additional projects not listed in the IFP are located at the end of the matrix. The matrix is ordered according to sub-regions as found in the IFP. Abbreviations are as follows: Total System = TS; Kissimmee Valley = KV; Greater Lake Okeechobee = GL; Central Everglades = CE; Southeast Urban and Coastal Areas = SE; Southwest Florida/ Big Cypress Basin = SW; Florida Keys = FK.

#### Special Notes on Matrix:

- Other Project Elements (OPE)- The Alternative Evaluation Team (AET) considers project's results when evaluating Restudy alternatives.
- Critical Projects- Progress of project must be reported to the Army Corps of Engineers periodically for approval.
- Those projects listed in **BOLD** seem to lack sufficient coordination with the Restudy.

Project Name	Region	Lead Person/Agency	Description (link to restudy)	Coordination w/ Restudy
<b>TOTAL SYSTEM</b>				
BMP's for Agriculture	TS 05	Hendricks, Greg; NRCS (561) 795-5451	Applied Agriculture Land Conservation Water Quality Enhancement	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Economic Analysis of AG Land and Water Mgt.	TS 10	Caswell, Margriet; USDA-ERS (202) 219-0507	Research Land/Water Mgt.	<b>Project not being fulfilled as planned, No funding</b>
Fire Management Plans for Public Lands	TS 13	Folks, John; FDACS (850) 414-9928	Ecosystem Mgt.	<b>No Restudy Coordination, recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Florida Greenways System Implementation - Federal Involvement	TS 14	Caffin, Debbie; USFS, FDEP (850) 942-9376	Land Procurement	Draft plan for greenways in FL will be distributed to all federal agencies for comment. GCSSF staff request plan be sent to Restudy team.

Multi-Species Recovery Strategy	TS 19	Johnson, Craig; USFWS (407)562-3909	Plan – Wildlife Habitat	Direct integration into Restudy
Supplemental Water Quality Treatment Technology Demonstration	TS 23	Aumen, Nick; SFWMD, FDEP (561) 682-6601	Water Quality	Addressed by Restudy Water Quality Sub-team.
Technical Assistance to Seminole & Miccosukee Indian Reservations	TS24	Smola, Ron; NRCS (561) 686-8800	Water Quality	Coordination with USACE through Carol Drungle in Jax. Office, will be included in Restudy monitoring plan.
Wetland Restoration on Private Lands	TS27	Hendricks, Greg; NRCS (561) 795-5451	Land Restoration	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Models and Model Enhancements	TS40	Higer, Aaron; USCG (561) 682-6560	Water Quality, Hydrology	Integration into SF Water Mgmt. Model (hydrology model used by Restudy)
Geodetic Vertical Control Surveys	TS 52	Woolam, Scott; FDEP (850) 488-2427	Topographic Data	Critical Project. Data published in National Geodetic Survey. Data will be used by Restudy if needed.
Natural System Boundary Alternatives & Natural Lands Information System	TS 55	Haddad, Ken; FDEP (813) 896-8626	Research – Natural System	Asked by Working Group to link to Restudy, will be included in Restudy monitoring program. Some project team members on restudy team. SRAC.
Identification & Documentation of Ecosystem Reference Areas as a Biodiversity Monitoring Framework	TS 56	Minasian, Leo; FDEP Greenways and Trails Dept., NBS, USFWS, EPA (850) 488-3701	Research – Wildlife Habitat	Will be included in Restudy monitoring plan.

Integrated Mgt. Pgm. for Invasive Species within High Quality Natural Areas of S. Florida	TS 61	Jipsen, Wayne; USACE, SFWMD, ENP, BCNP, FDEP (904) 232-2219	Plan – Exotic Plant Control	Integrating as a feature of Restudy Comprehensive Plan.
Public Education for the Restoration Project	TS62	Lewis, Jim; FDEP (850) 488-9334	Outreach- Public Education	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Coordinated Mgt. Pgm. for Invasive Plant Species On Public and Private Lands in South Florida	TS 83	Jipsen, Wayne; USACE (904) 232-2219	Plan – Exotic Plant Control	Integrating as a feature of Restudy Comprehensive Plan
Seminole Tribe Data Collection and Monitoring	TS 85	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Data – Water Quality	WQ data submitted to EPA, SFWMD. Stakeholder input to GCSSF on Restudy. Attend SFWMD Gov. Brd. WKshop on Restudy. Will be included in Restudy monitoring plan.
Seminole Tribe Development of Water Quality Standards	TS 86	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality	see above TS 85
<b>KISSIMMEE VALLEY</b>				
Kissimmee River Restoration Project	KV 01	Brooks-Hall, Kim; USACE, SFWMD, (904) 232-3155	Hydrology, Land Acquisition & Restoration	Restudy considers project results in 2050 model.
Upper Lakes Basin Watershed	KV06	Rinaldi, Chuck; SFWMD, (561) 682-8537	Land Acquisition	Restudy considers project results in 2050 model.

<b>GREATER LAKE OKEECHOBEE</b> Herbert Hoover Dike Stabilization	GL01	Brooks-Hall, Kim; USACE, (904) 232-3155	Hydrology, Infrastructure	Restudy considers project results in 2050 model. Presented recommendations to Restudy team and District Governing Board. Some project members are involved with Restudy.
Lake Okeechobee Regulation Schedule Review	GL03	Brooks-Hall, Kim; USACE, (904) 232-3155	Hydrology, Water Quality, Volume, and Timing	Interim action to Restudy, expecting changes in future. Also, see GL01.
Buck Island Agroecology Study	GL04	Steinman, Alan; SFWMD, (561) 682-6492	Water Quality	Program early in work, will incorporate in restudy
Lake Okeechobee Water Retention/Phosphorous Removal	GL06	Rosen, Barry; SFWMD, (561) 682-6348	Hydrology, Water Quality	Critical Project. Other Project Elements (OPE).
Lake Okeechobee Tributary Sediment Dredging	GL07	Rosen, Barry; SFWMD, (561) 682-6348	Water Quality	Critical Project not yet funded. OPE.
West Palm Beach Wetland Reclamation Project	GL08	Olson, Erik; City of West Palm Beach, (561) 659- 8085	Hydrology	Critical Project. OPE.
Loxahatchee Slough	GL13	Rinaldi, Chuck; SFWMD, Palm Beach County, (561) 682-6537	Land Acquisition	Critical Project. Combined with GL26
Indian River Lagoon Restoration Feasibility Study	GL19	Hornung, Lewis; USACE, (561) 682-6616	Hydrology, Water Quality	Integrating as feature of Restudy Comp. Plan, Indian River Lagoon Feasibility Study

Upper East Coast Regional Attenuation Facilities/Water Preserve Areas	GL21	Warner, Paul; SFWMD, (561) 682-6634	Land Acquisition, Hydrology	Will be deleted because overlap with GL 25 & GL 29.
Ecological Impact of Water Project for Ten Mile Creek Property	GL23	Arnold, Calvin; IFAS, NRCS, (561) 468-3922	Hydrology, Water Quality	Should be eliminated due to overlap with GL25. Unfunded, research/monitoring to be done prior to GL25.
L-8 Canal Water Catchment Area - Loxahatchee Slough Infrastructure improvements	GL24	Olson, Erik; City of West Palm Beach, (561) 659-8085	Infrastructure	Critical Project. Integrating as feature of Restudy Comprehensive plan
Ten Mile Creek Water Preserve Area	GL25	Unsell, Dave; SFWMD, (561) 682-6888	Land Acquisition, Water Quality	Critical Project. Integrate as feature of Restudy Comprehensive Plan, Indian River Lagoon Feasibility Study Critical Project.
Loxahatchee Slough Ecosystem Restoration	GL26	Lund, Frank; SFWMD (561) 682-6631 Brennan, Palm Beach Co. DERM, (561) 233-2494	Infrastructure, Hydrology	Integrating as feature of Restudy Comprehensive Plan. Critical Project. Combined with GL13.
Cypress Creek Restoration Project	GL28	Sexton, Matt; Conservation Fund, (561) 624-4928	Land Acquisition, Hydrology	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Allapattah Flats	GL29	Rinaldi, Chuck; SFWMD, (561) 682-6537	Land Acquisition, Hydrology	Feature of Restudy Comprehensive Plan, Indian River Lagoon Feasibility Study
Bolles and Cross Canal Improvements	GL30	Moczynski, Paul; USACE 902-232-3846	Infrastructure, Water Quality	OPE. Restudy person on project team. Pricilla Trigg.

Everglades Program	GL31	Hall, Alan Goforth, Gary; SFWMD, (561) 682-6280	Land Acquisition, Hydrology, Water Quality	Restudy considers project results in 2050 model. Includes GL35, GL52, & CE15. Everglades Pgm Imp. Mgt. Plan published annually.
EAA Lands/Water Management area(s) - Land from Willing Sellers for Water Storage, Detention and Water Quality Treatment	GL33	Rinaldi, Chuck; SFWMD, DOI, (561) 682-6537	Land Acquisition, Hydrology, Water Quality	Negotiations in progress through DOI. Feature of Restudy Comprehensive Plan
Rotenberger/Holey Land Wildlife Management Areas	GL34	Perkins, Ralph; FDEP, (850) 488-2351	Land Acquisition	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Stormwater Treatment Areas 1-West and 2 through 6	GL35	Rinaldi, Chuck; SFWMD, (561) 682-6537	Land Acquisition	Restudy considers project results in 2050 model.
Technical Assistance to EAA and C-139 Basin	GL36	Boyd, William, NRCS, (561) 795-5451	Water Quality, Water Supply, Applied Agriculture Land Conservation	Coordinated w/ARS. W. Boyd on Central FL PCT. Presented to Corps by C. Drungle in Jax. Not being considered by Restudy at this time.
Sustainable Agriculture in the Everglades Agricultural Area	GL39	Miller, Jim; ARS, (561) 924-5227	Hydrology, Water Storage	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making.</b> *This project, if successful, would increase water levels in EAA w/o reducing sugar production. Restudy should consider increased water allotment in EAA to prevent soil subsidence.

Development of Diverse Sugarcane Germplasm and its use in Improved Varieties	GL40	Miller, Jim; ARS, (561) 924-5227	Research	Recognized as ongoing effort, not directly factored in Restudy decision-making
Lake Okeechobee Demonstration ASR Project	GL41	Devillon, Lou; SFWMD, (561) 682-6383	Hydrology	Critical Project. Feature of Restudy Comp. Plan.
WCA-3A West Hydropattern Restoration	GL52	Hornung, Lewis; USACE, (561) 682-6616	Hydrology	Restudy considers project results in 2050 model. Data will be used if needed.
Seminole Tribe Best Management Practices for the Brighton Reservation	GL53	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality	Recognized as ongoing effort, not directly factored in Restudy decision-making. Water Quality sub-team issue. Outside scale of Restudy. see TS85
Seminole Tribe Comprehensive Surface Water Management System for the Brighton Reservation	GL54	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Hydrology, Water Quality	see TS85 & GL53
Palm Beach Co Water Utilities	GL55	Hadjimiry, Hasam; Palm Beach County, (561) 434-5359	Water Quality, Water Supply	Not coordinated with Restudy.
Floridan Aquifer Restoration	GL56	Smith, Donna; USDA, NRCS, (561) 461-4546	Water Quality	Recognized as ongoing effort, not directly factored in Restudy decision-making. Should be in Restudy-FW attenuation. Upper east coast not included enough.

Urban Mobile Irrigation Lab	GL57	Smith, Donna; USDA, NRCS, (561) 461-4546	Water Quality	Recognized as ongoing effort, not directly factored in Restudy decision-making. See GL56
Caloosahatchee River	GL58	Dawdy, Dick; SFWMD, (941) 338-2929	Hydrology	Potential feasibility study. Liaison between Caloosahatchee Adv. Cmte. and Corps. Presentations by S. Appelbaum & Col. Miller.
<b>CENTRAL EVERGLADES</b>				
WCA-2A Regulation Schedule Review	CE01	Brooks-Hall, Kim; USACE, (904) 232-3155	Hydrology	Recognized as ongoing effort, not directly factored in Restudy decision-making. Project on hold for now.
Water Conservation Areas: Inholdings, Mineral Rights, and other interests	CE02	Rinaldi, Chuck; SFWMD, (561) 682-6537	Land Acquisition	Recognized as ongoing effort, not directly factored in Restudy decision-making.
Soil Survey for Everglades National Park, Big Cypress, & Water Conservation Areas	CE05	Hendricks, Greg; NRCS, (561) 795-5451	Hydrology, Research	Will be included in Restudy Monitoring Plan.
Canal C-111 Project	CE06	Landers, Glenn; USACE, (904) 232-2125	Hydrology	Restudy considers project results in 2050 model. Data will be used if needed.
Modified Water Deliveries to Everglades National Park	CE10	Ring, Dick, ENP; USACE, (305) 242-7710	Hydrology	Restudy considers project results in 2050 model. Data will be used if needed.

Additional Lands- 8.5 Square Mile Area	CE11	Outland, John; FDEP, (850) 488-4892	Land Acquisition, Hydrology	Restudy considers project results in 2050 model. Data will be used if needed.
East Everglades Addition to Everglades National Park	CE12	Ring, Dick; NPS, (305) 242-7710	Hydrology, Land Acquisition	Restudy considers project results in 2050 model. Data will be used if needed.
Experimental Program of Modified Water Deliveries to ENP	CE13	Landers, Glenn; USACE, (904) 232-2125	Hydrology	Restudy considers project results in 2050 model. Data will be used if needed.
Nutrient Threshold/dosing	CE15	Fontaine, Tom; SFWMD, DOI, DEP, (561) 682-6551	Water Quality	Water Quality Sub-team issue. Linked to Restudy WQ model.
South Dade Wetlands	CE17	Rinaldi, Chuck; SFWMD, (561) 682-6537 & Young, Miami-Dade Co., (305) 375-3614	Hydrology, Water Quality, Land Acquisition	Feature of Restudy Comprehensive Plan.
C-111 Basin Hydrologic Investigations and Model Department	CE19	Generaux, Graham; U of Florida, FIU,	Hydrology, Water Quality	FIU modeling to be integrated into Restudy when completed.
West Dade Wastewater Reuse Study	CE25	Landers, Glenn; USACE, MDWASD, (904) 232-2125	Water Quality, Hydrology	Feature of Restudy Comprehensive Plan
Everglades Landscape and Everglades Water Quality Model Development	CE29	Fontaine, Tom; SFWMD, (561) 682-6551	Water Quality, Hydrology	Model integrated in Restudy.
Everglades Tree Island Research and Monitoring Initiative: Phase 1	CE30	Sklar, Fred; SFWMD, FGFWFC, (561) 686-6504	Water Quality, Hydrology	Attend Restudy meetings, work with L. Heisler Will be in Restudy Monitoring Plan.

Inventory of Tree Islands in WCAs 2 and 3	CE31	Heisler, Lorraine; GFWFC, (561) 778-5094	Hydrology, Research	1 <sup>st</sup> year results used to evaluate Restudy Alt. as part of F&W report submitted to Congress along w/ Comp Plan. Will be in Restudy Monitoring Plan. L. Heisler on Restudy Team.
Phosphorous Monitoring at Loxahatchee NWR	CE34	Jewell, Sue; USFWS, (561) 732-3684	Water Quality	Will be in Restudy Monitoring Plan.
Exotic Plant Control on Loxahatchee National Wildlife Refuge	CE35	Jewell, Sue; USFWS, (561) 732-3684	Habitat Restoration, Hydrology	<b>Not coordinated at this time.</b>
Miccosukee Tribe Water Management Area	CE36	Duncan, Gene; Miccosukee Tribe, (305) 223-8380	Hydrology, Water Quality	Critical Project. OPE
Miccosukee Tribe Water Management	CE37	Duncan, Gene; Miccosukee Tribe, (305) 223-8380	Hydrology, Water Quality	see CE36
Subregional characterization of the geological framework of the subsurface coarse sand zone and its influence on Florida Bay and the southern Florida ecosystem	CE38	Scott, Tom; FDEP, FGS (850) 488-9380	Hydrology, Research	Not funded at this time. Will be included in Restudy Monitoring Plan.
L-28 Modification Project	CE39	Brooks-Hall, Kim; USACE, (904) 232-3155 & Houser, SFWMD	Hydrology	Critical Project. Integrated as feature of Restudy Comp Plan. Product of Restudy.
Nutrient Threshold/Dosing Studies for ENP & Loxahatchee National Wildlife Refuge	CE 40	Johnson, Bob; ENP, (305) 242-7710	Water Quality	Will be in Restudy Monitoring Plan.

<b>SOUTHEAST COAST</b>						
Homestead Air Reserve Base Realignment and Closure	SE01	Harvey, Richard; USEPA (561) 615-5292	Water Quality, Land Acquisition, Land Restoration	Recognized as ongoing effort, not directly factored in Restudy decision-making. Not coordinated with Restudy.		
Stormwater Treatment Area 1-East	SE03	Rinaldi, Chuck; USACE, SFWMD, (561) 682-6537	Hydrology, Land Acquisition, Land Restoration	Restudy considers project results in 2050 model.		
East Coast Buffer/Water Preserve Areas	SE05	Jackson, Jim; SFWMD, DOI, (561) 682-6334	Hydrology, Water Quality, Land Acquisition	Feature of Restudy Comp Plan		
South Biscayne Bay Watershed Management Plan	SE06	Rawlinson, Lee, Miami-Dade County; (305) 375-2557	Hydrology, Water Quality, Land Acquisition	Critical Project. Funding from SFWMD. Will have oversight board with representatives from SFWMD & Corps.		
Freshwater Lake Belts EIS	SE07	Jackson, Jim; SFWMD, (561) 682-6334	Hydrology, Water Quality, Land Acquisition	Feature of Restudy Comp Plan. E. Coast Buffer concept. Project done in a way that facilitates Restudy and keeps option open. Considers hydrologic impact of Lakebelt on Restudy.		
Establishing BMPs for Agricultural and Urban Areas of the Eastern C-111 Basin	SE10	Folks, John; FDACS (850) 414-9928	Water Quality, Research, Hydrology	Critical Project. OPE.		
Agriculture and Rural Land Retention Study	SE11	Rawlinson, Lee; Miami-Dade County, SFWMD, DCA, Miami-Dade County Farm Bureau, (305) 375-2557	Land Acquisition, Land Restoration	see SE06.		

Hillsboro Pilot ASR Project	SE14	Devillon, Lou; SFWMD, USACE, (561) 682-6383	Water Storage, Research	Critical Project. Feature of Restudy Comp Plan. Project persons working with Restudy.
L3IE Flow Redistribution Project	SE17	Alleman, Rick; SFWMD, USACE, (561) 682-6716	Hydrology	Feature of Restudy Comp Plan. Critical Project. Lacking coordinated ideas though.
East Coast Canal Structures: C-4 and C-6	SE21	Marban, Jorge; SFWMD, USACE, (561) 682-6501 & Paul Larson (305) 358-0361	Hydrology	Critical Project. Feature of Comprehensive Plan.
South Dade Wetlands Addition	SE27	Frost, Dick; NPS, (305) 230-1144	Land Acquisition, Water Quality	Feature of Restudy Comp Plan
Biscayne Bay Feasibility Study	SE28	Landers, Glen; USACE (904) 232-2125	Hydrology, Water Quality	Model integration into Restudy. Restudy person on project team, P. Trigg.
Comprehensive Water Quality Standards for Biscayne Bay	SE29	Frost, Dick; NPS, (305) 230-1144	Water Quality	<b>Recognized as ongoing effort, not directly factored in Restudy decision-making</b>
Ground-Water Quality Discharge Standards	SE32	Frost, Dick/Curry; NPS (305) 230-1144	Water Quality	See above SE29
Ground-Water Quality in Coastal Environments	SE33	Frost, Dick/Curry; NPS (305) 230-1144	Water Quality	See above SE29
Surface Water Management Master Plan for the former Homestead Air Force Base	SE34	Hernandez, Pedro; Miami-Dade County Aviation Dept., USAF, (305) 876-7928	Hydrology, Water Quality	See above SE29
Dade County Environmentally Endangered Lands Program	SE37	Young, Emily; Miami-Dade County DERM (305) 375-3614	Land Acquisition, Land Management	Participation in Restudy meetings

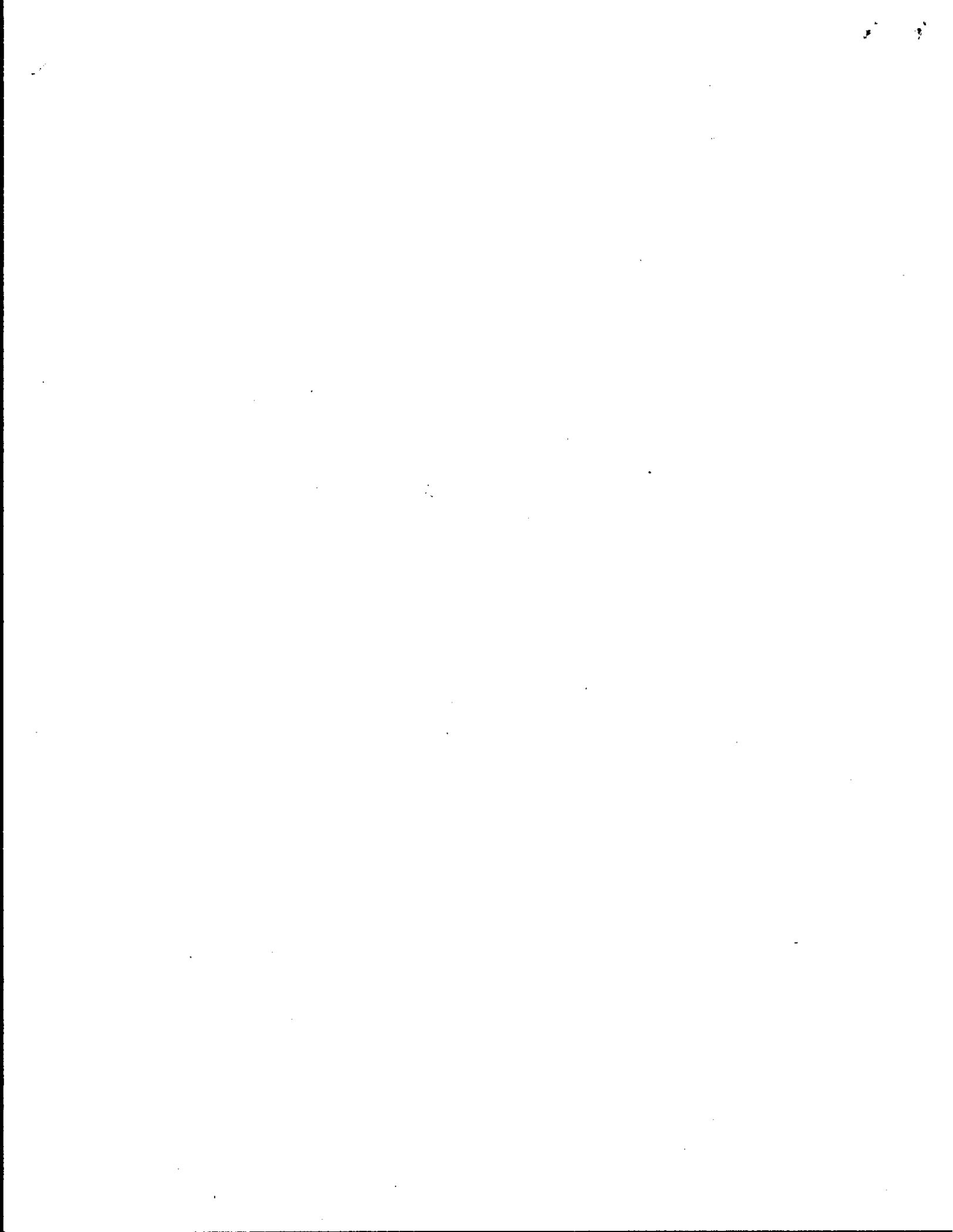
Biscayne Bay Ecosystem Restoration Assessment	SE39	Frost, Dick; NPS, Lynch, Pat; Chief of Resource Mgmt., (305) 230-1144 x3020	Water Quality	In Conceptual Stage at this time. Upon funding, coordination with Restudy will be required.
Western Water Quality Treatment Project	SE41	Dollar, Melissa; USACE, (904) 232-2584	Water Quality, Hydrology	Critical Project. Should be included as part of Restudy.
<b>SOUTHWEST/BIG CYPRESS</b>				
Additional Water Conveyance Structures Under Tamiami Trail	SW01	Hibbard, Wally; NPS, (941) 695-2000	Hydrology	Critical Project. OPE. Little inclusion in Restudy West of L-28.
Seminole Tribe Water Conservation Project for Big Cypress	SW03	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Hydrology, Water Quality	Critical Project, OPE. See TS85
Belle Meade Land Acquisition	SW04	Boler, Bruce; FDEP, (941) 332-6975	Land Acquisition, Water Quality	OPE w/ SW09
Big Cypress National Preserve Addition	SW05	Hibbard, Wally; NPS, (941) 695-2000	Land Acquisition	Critical Project. 2050 Restudy model considers project results
Corkscrew Regional Ecosystem Watershed	SW08	Rinaldi, Chuck; SFWMD, (561) 682-6537	Hydrology, Water Quality	Part of project is Critical Project.
Fakahatchee Strand	SW09	Boler, Bruce; FDEP, (941) 332-6975	Hydrology, Land Acquisition	OPE w/ SW04
Southern Golden Gate Estates Hydrological Restoration	SW10	Perkins, Ralph; (850) 488-2351 Ananta Nath (941) 597-1505 FDEP, SFWMD, USACE	Hydrology, Water Quality	Critical Project. OPE.
Southern CREW Project Addition/Imperial River Flowways	SW12	Merriam, Chip; SFWMD, USACE, (941) 338-2929	Hydrology, Water Quality	Critical Project. OPE.

Twelve Mile Slough	SW13	Rinaldi, Chuck; SFWMD, (561) 682-6537	Hydrology, Water Quality	Recognized as ongoing effort, not directly factored in Restudy decision-making.
Seminole Tribe Best Management Practices for the Big Cypress Reservation	SW14	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality	Recognized as ongoing effort, not directly factored in Restudy decision-making. See TS85
Seminole Tribe Exotic Species Removal	SW15	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality, Hydrology, Habitat Restoration	Recognized as ongoing effort, not directly factored in Restudy decision-making. See TS85.
Picayune Strand State Forest Exotic Species Management	SW16	Folks, John; FDACS, (850) 414-9928	Habitat Restoration	Recognized as ongoing effort, not directly factored in Restudy decision-making. See TS85.
Assimilative Capacity for Phosphorus of C&SF Canals on the Big Cypress Reservation	SW17	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality, Research	Will be in Restudy Monitoring Plan. See TS85.
Nutrient Uptake Research for Cypress	SW18	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality, Research	Recognized as ongoing effort, not directly factored in Restudy decision-making. See TS85.
Impacts of Sludge Deposition on Phosphorus Levels on the Big Cypress Reservation	SW19	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality, Research	Recognized as ongoing effort, not directly factored in Restudy decision-making. See TS85.
Melaleuca Control (Critical)	SW20	Hibbard, Wally; NPS, (941) 695-2000	Habitat Restoration	Critical Project.

Henderson Creek/Belle Meade Restoration	SW24	Haner, Judy; FDEP, (941) 417-6310	Hydrology, Water Quality	Critical Project. OPE. FGFWFC incl. in Restudy.
Lake Trafford Restoration	SW26	Boler, Bruce; SFWMD, Collier County, DEP, (941) 332-6975	Water Quality	Critical Project. OPE.
Estero Bay	SW28	Boler, Bruce; FDEP, (941) 332-6975	Water Quality	Requested to be included in Restudy, but project area not looked at by Restudy.
Lake Park Restoration Project	SW29	Boler, Bruce; Lee County, Private, (941) 332-6975	Water Quality	Requested to be included in Restudy, but project area not looked at by Restudy.
Town Of Ft. Myers Beach Storm Water Retrofit	SW30	Boler, Bruce; Ft. Myers Beach, (941) 332-6975	Water Quality	Critical Project. OPE
Rookery Bay	SW31	Boler, Bruce; FDEP, (941) 332-6975	Habitat Restoration	Requested to be included in Restudy, but project area not looked at by Restudy.
Collier Seminole State Park Exotic Removal Project	SW33	Henry, Bob; DEP, (941) 394-3397	Habitat Restoration	Recognized as ongoing effort, not directly factored in Restudy decision-making.
Fakahatchee Strand State Preserve Exotic Removal Project	SW34	Toppin, Greg; DEP, (941) 695-4593	Habitat Restoration	Waiting for funding, ongoing projects reported to (Ilene Barnett) for annual report.
Estero Bay Aquatic Preserve and Buffer Reserve Enhancement and Exotic Removal Project	SW35	Stafford, Heather; DEP, (941) 463-3240	Habitat Restoration	Not being considered at this time, past project results reported to Ilene Barnett, now to Bruce Boler
Seminole Critical Project for the West side of the Big Cypress Water Conservation Project	SW39	Tepper, Craig; Seminole Tribe of Florida, (954) 966-6300 x1120	Water Quality, Hydrology	OPE. See TS85.

<p><b>FLORIDA KEYS</b> Florida Keys National Marine Sanctuary Water Quality Protection Program</p>	<p>FK18</p>	<p>McManus, Fred; USEPA, 404-562-9385</p>	<p>Water Quality</p>	<p>Recognized as ongoing effort, coordination through steering committee members involved with Restudy.</p>
<p><b>PROJECTS NOT IN</b></p>				
<p>1998 Integrated Financial Plan (IFP)</p>	<p>TS</p>	<p>Smith, Charlie; FDOT (850) 414-4500</p>	<p>Hydrology</p>	<p>Not formally coordinated with Restudy. Informal coordination through Mark Evans (ACOE) (904) 232-2028. Routes proposed tend to follow well established upland transportation corridors with minimal wetland impacts.</p>
<p>Lake Worth Lagoon Management Plan</p>	<p>GL</p>	<p>Powell, Ginny; DEP, Lake Worth Lagoon Coordinator (561) 681-6681</p>	<p>Water Quality</p>	<p>Restudy calls for modification to L.W.L. Basin, including C-17, C-51, and C-16. Coordinated with SFWMD.</p>
<p>Miami River</p>	<p>SE</p>	<p>Fleming, Betty; Miami River Coordinating Committee, (305) 373-1915</p>	<p>Water Quality, Hydrology</p>	<p>Work with 37 agencies that have jurisdiction on Miami River; DERM working with ACOE on dredging aspects</p>
<p>Conservation Easements for Multi-Species Recovery and Water Quality Maintenance</p>	<p>SW</p>	<p>Krakowski, Jim; USFWS, (941) 353-8442 x27 Eller, Andy; USFWS, (941) 353-2814</p>	<p>Land Acquisition, Management</p>	<p>Direct Integration into Restudy, Supplemental to TS19</p>

FL Bay Response to Hydrology Component	FK	Sklar, Fred; SFWMD (561) 682-6504	Water Quality, Hydrology, Habitat Restoration	Part of Restudy Monitoring. Coordination between committee members – FL Bay Pgm Mgt Committee (PMC)
Strategic Plan for the Interagency Florida Bay Science Program	FK	Armantano, Tom; ENP, (305) 242-7801	Water Quality, Research	Presentations to Restudy team members. Members of PMC or their staff are involved in Restudy process.
US-1 South Project	FK	Ciscar, Mike; FDOT, (305) 470-5200	Hydrology	Provisions have been made for potential C-111 spreader canal under US-1; pipe and box culverts are designed throughout US-1 project for east-west water conveyance.



**ERRATA SHEET FOR JULY 27, 1998 VERSION**  
***GCSSF INTERIM REPORT ON THE C&SF PROJECT RESTUDY***

Inadvertent Omitted Amendments and Post-Meeting Staff Edits

Page 2, 4<sup>th</sup> bullet: "seepage losses" [staff clarifying edit - suggested by Roy Rogers]  
Page 4, 1<sup>st</sup> full paragraph: "Miami-Dade, Palm Beach, Broward and Lee" [amendment 43]

Page 12; Recommendation 11: Took recommendation from top of page 11, repeated it and numbered it as a recommendation [amendment 78A]

NOTE: this also renumbers all later recommendations.

Page 19; Recommendation 13: "water quality protection" [amendment 287]

Page 20; Recommendation 18: Took recommendation from end of 2<sup>nd</sup> paragraph on page 16, repeated it and numbered it as a recommendation [amendment 88A]

Page 20; Recommendation 19: Capitalized "National Oceanic and Atmospheric Administration" - staff edit

Page 24; Recommendation 25: Substituted "Comprehensive Plan" for "Restudy" [amendment 291]

Page 24; next to last paragraph: Multiple tense changes [amendment 293]

Page 25; 1<sup>st</sup> paragraph: "urban areas, ~~the~~ tribes and the environment." [amendment 294]

Page 27; 1<sup>st</sup> paragraph: "this goal should be addressed by the Restudy to the extent feasible possible because the SFWMD" [amendment 123]

Page 27: Five changes of "level of service" to "level-of-certainty" [amendment 123]

Page 34; Recommendation 32: Moved recommendation from Section G (Coordination of Activities) to Section F (Southwest Florida Issues) [amendments 134 & 138; staff edit]

APPENDIX II; p. i: added appendix explanation [staff edit]

