APPENDIX G

SOCIO-ECONOMICS

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APPENDIX G
SOCIO-ECONOMICS

G.1 INTRODUCTION

The Water Preserve Areas (WPA) recommended plan is a major piece of the Comprehensive Everglades Restoration Plan (CERP). This part of the feasibility study is concerned with the socio-economic effects of plan implementation. Anticipated effects include potential impacts to national economic efficiency (NED account), due to impacts on agricultural and urban water supply, flooding, navigation, fishing, and recreation, as well as the plan implementation. There will also be economic impacts to the region, including potential changes in income, employment, and economic output.

G.2 NATIONAL ECONOMIC EFFICIENCY IMPACTS

G.2.1 General

The mosaic of the many component parts of the overall CERP is such that when it is fully implemented, the CERP will have system-wide effects, resulting from the many subparts of the system, operating in concert together. To the extent identifiable and measurable, these effects have been discussed and described in Appendix E, Socio-Economics, of the Central and Southern Florida Project Comprehensive Review Study (April 1999). For the most part, measuring the partial contribution to the total NED economic impacts of individual parts of the CERP, such as the WPA plan, is beyond the resolution of the models and methodologies that have been used to describe these impacts.

G.2.2 Water Supply

In the case of urban and agricultural water supply, the WPA plan provides an important function in capturing and retaining water that would be lost to tide without this part of the system implemented. Although this is not the only part of the system that makes more water available with vs. without the overall plan, it plays a major and significant role, improving water deliveries for both the natural system and for agricultural and urban uses. Without it, the economic impacts of improvements described in Appendix E of the Comprehensive Review Study would not be realized unless there were to be major revisions to the system, if possible at all.

G.2.3 Flood Control

A key design criterion and goal throughout the development of the WPA system components has been that flooding of developed areas will the same or improved with the WPA plan implemented as compared to without the WPA plan in place. No flooding of residential or commercial properties will be caused by implementation of the WPA plan. With the additional storage retention capacity, the resulting flood attenuation in the various drainage basins will most likely result in some improvement in the flooding situation, although this effect has not been measured and is considered to be incidental to plan implementation.

In the case of the Holly Lake residential mobile home community in Broward County, between Water Conservation Area 3 and Highway 27, just north of Hollywood Boulevard, it appeared in the early stages of project planning that WPA implementation could have had flooding implications for this development. The concern was that water levels could at times be higher in this area with the WPA plan than without it. Structural and operational measures to limit water levels to no higher than without the WPA plan were considered. An important issue involved in including such measures in the WPA plan is the cost of buying the property in the Holly Lake community and relocating its residents. This cost was a constraint benchmark in planning water elevation control measures for Holly Lake. If prudent cost effective measures to avert higher water levels in the Holly Lake community with vs. without implementation of the WPA plan would be less costly than acquiring the Holly Lake property, then it would be economical to do so.

An evaluation for planning purposes was conducted to determine the cost effectiveness of providing protection to the Holly Lake community, comparing incremental costs of doing so with a rough estimate of a buyout and relocation. It was determined that it would be far less costly to protect the community than to acquire this property and relocate the residents. The costs of buying the real estate and relocating the residents, including Federal and non-Federal government administrative costs, would be well over $60 million. The extra cost associated with keeping the community from being any wetter with vs. without the project in place is far less.

G.2.4 Navigation, Recreation, and Fishing

There are no impacts of the WPA plan to commercial navigation. The plan does include a small amount of recreational facilities, which will afford recreational opportunities for residents and visitors. There have been no attempts to measure the net increase in recreational activity, or the value of this recreation. It is considered to be incidental to project implementation. Although we have not estimated the amount of visitation to occur with the project in place, the rate of visits per year at Federal lakes is growing 2 percent annually (NRLSC, Final

Report), faster than the growth in population. The WPA project, to the extent that recreational access is being provided, is likely to share in this general trend.

The project includes a boat ramp and parking lot along C-11, which will provide access to this impoundment. Also, a scenic overlook will be constructed on the site. This will provide recreation benefits to fishermen, boaters, birdwatchers, nature enthusiasts, day hikers and others. There will also be a parking lot at the C-9 impoundment for visitors, with similar recreational activity opportunities.

The C-9, C-11, and Hillsboro impoundments will include a 30-foot littoral fish zone, which will provide abundant fishing opportunities for residents and tourists. There will also be wind barriers (tree islands) which afford sightseeing and nature watching opportunities to boaters. Access will be available.

There is currently an airboat recreation center at Hillsboro, and the construction of the Hillsboro impoundment will most likely enhance the recreational opportunities at this site.

G.2.5 Cost Effectiveness in Design

Economic efficiency was a criterion throughout the design process. All other things being equal, when two or more ways appeared to be available to accomplish design goals and project effectiveness, the least costly method was always the desired choice. One of these issues involved the comparison of three different construction types for the provision of culvert drainage function throughout the project. It was not intuitively obvious initially which design would be most cost effective, since they had different costs and different expected effective lives, at the end of which replacement would be required.

A cost analysis was done for three culvert configurations, which under similar head conditions would have similar discharge rates. The 3 configurations and their respective costs are:

Concrete Box Culvert

Number	2
Size	5' X 5' Box
Gates	Vertical Lift, Remote Controlled
Length	60 feet
Protection	Headwalls, Inlet and Outlet
Preliminary Construction Cost	$179,000

Reinforced Concrete Pipe (RCP)

Number	2
Size	72" Barrels
Gates	Vertical Lift, Remote Controlled
Length	60 feet
Protection	Headwalls, Inlet and Outlet
Preliminary Construction Cost	$160,400

Corrugated Metal Pipe (CMP)

Number	2
Size	72" Barrels
Gates	Vertical Lift, Remote Controlled
Length	60 feet
Protection	Headwalls, Inlet and Outlet
Preliminary Construction Cost	$149,000

CMP initial construction cost is the least expensive. RCP initial construction cost is 7.6% higher than CMP. Box Culvert initial construction cost is 20% higher than CMP. ***Table G.2-1*** compares the effective life cycle costs of the three construction types using two different interest rates (FY 2001's discount rate of 6.375%, prescribed by policy for use in Federal water resource project evaluation, and last year's rate of 6.625% for comparison purposes). Although the initial cost of CMP is less, its replacement requirements due to its shorter useful life makes RCP more cost effective.

TABLE G.2-1 LIFE CYCLE COMPARISON COSTS

Alternative Cost Comparison [1/]				
Alternative	Useful Life [2/]	Initial Cost	Average Annual Cost [3/]	
			@6.625%	@6.375%
Concrete Box Culvert (CBC)	50 Years	$179,000	$12,359	$11,955
Corrugated Metal Pipe (CMP)	30 Years	$149,000	$11,558	$11,263
Reinforced Concrete Pipe (RCP)	50 Years	$160,400	$11,075	$10,713

[1/] In constant dollar fixed price levels
[2/] After which replacement is required
[3/] Equivalent uniform annual cost at indicated annual discount rate

G.3 REGIONAL ECONOMIC IMPACTS

G.3.0 Introduction and Background

Implementation of the WPA plan involves the injection into the local economy of a large amount of construction and land acquisition funds. As this economic activity takes place, there are impacts throughout the regional economy. This part of the report addresses the nature, extent, and significance of these effects.

There are four main project sites, in three counties, that are of concern in addressing the social and economic impacts of the WPA plan implementation. They are outlined below.

Palm Beach County:	Hillsboro Impoundment Strazzulla Wetlands
Broward County:	Broward County WPA
Miami-Dade County:	Dade Broward Levee & Canal

G.3.1 Component Site Demographics

Describing some of the demographic characteristics for project site census tracts, counties, and the State of Florida, helps provide a basis for understanding the socio-economic context in which plan implementation will take place. Some of these characteristics are outlined below.

For the sites in Palm Beach County (see ***Table G.3-1***), growth has been faster than for the state as a whole, and the non-white and Hispanic population percentages are less than on a statewide basis. For the census tracts in the immediate area of the project sites, these percentages are significantly lower. The census tracts were located using the Census Bureau's American FactFinder software.

For the sites in Broward County (see ***Table G.3-2***), growth has been faster than for the state as a whole. The non-white % of the population is greater than on a statewide average, and the Hispanic population % is lower. The black population in the census tracts in the immediate area of the project sites is well below that for the county and the state, although the Hispanic population is higher.

For the sites in Miami-Dade County (see ***Table G.3-3***), growth has been below that for the state as a whole, and the non-white and Hispanic populations

represent a larger % of the county's population than on a statewide basis. The black population in the census tracts in the immediate area of the project sites is below that for the county and the state. The Hispanic population in the immediate census tract areas is above that for the county and the state.

The U.S. Bureau of the Census, Small Area Income and Poverty Estimates (1997) survey provided a count of persons below the poverty level in Florida and the following counties. Information on the percentage of minorities residing in Florida are from the U.S. Bureau of the Census in the 2000 Census.

Florida:

Percent change in population, 1990-1999	16.8%
Percent below poverty level, 1997 estimate	14.4%
Percent Black population, 1999 estimate	15.4%
Percent Hispanic population	15.4%

Palm Beach County:

Population 1999	1,049,420
Population 1990	863,518
Percent Change in Population, 1990-1999	21.5%
Percent Black Population, 1999	14.8%
Percent Black Population, 1990	12.5%
Percent Hispanic Origin, 1999	11.2%
Percent Hispanic Origin, 1990	7.7%

TABLE G.3-1 DEMOGRAPHICS OF PALM BEACH COUNTY PROJECT SITES

Palm Beach County Project Sites		
Item	Hillsboro Impoundment	Strazzulla Wetlands
Census Tract	77.18	79.02
Population	6,555	72
% White	97.2%	77.8%
% Non-white	2.5%	13.9%
% Hispanic	6.1%	31.9%
Per Capita Income	$19,488	$13,895
% Below Poverty Income Level	4.4%	0%

Broward County:

Population 1999	1,535,468
Population 1990	1,255,488
Percent change in Population, 1990-1999	22.3%
Percent Black Population, 1999	18.6%
Percent Black Population, 1990	15.4%
Percent Hispanic Origin, 1999	12.8%
Percent Hispanic Origin, 1990	8.6%

TABLE G.3-2 DEMOGRAPHICS OF BROWARD COUNTY PROJECT SITES

Broward County Project Sites	
Census Tracts	1103 & 703.02
Population	84,154
% White	89.4%
% Non-white	7.4%
% Hispanic	13.3%
Per Capita Income	$18,025
% Below Poverty Income Level	5.2%

Miami-Dade County:

Population 1999	2,175,634
Population 1990	1,937,094
Percent Change in Population, 1990-1999	12.3%
Percent Black Population, 1999	20.4%
Percent Black Population, 1990	20.5%
Percent Hispanic Origin, 1999	57.4%
Percent Hispanic Origin, 1990	49.2%

TABLE G.3-3 MIAMI-DADE COUNTY PROJECT COMPONENT SITES DEMOGRAPHICS

Miami-Dade County Project Sites	
Census Tract(s)	101.03, 101.19, & 102.21
Population	59,947
% White	88.0%
% Non-white	5.2%
% Hispanic	59.0%
Per Capita Income	$13,118
% Below Poverty Income Level	8.8%

G.3.2 General Description of Regional Impacts Due to Land Acquisition

The aim of this assessment is to address the demographic profile most likely affected by project implementation. The WPA project site areas do not coincide exactly with the census tracts for the area, but the census tracts provide a convenient area for which data is available, and are closer to the relatively small sub-county project site footprints. These census tract data provide a blueprint for the surrounding area, not exact characteristics of the sites. In most cases the project areas are located in rural settings, with minimal residents. In many of these areas the actual demographic makeup of the area may not be proportional to the census tract. For example, 10 percent of a census block in a rural area could contain 100% of the population. Nevertheless, it is a fair compromise and provides demographic profile descriptive information that is better than broad county-wide data.

In every project footprint the residents that appear to be directly impacted consist of less than 0.01% of the census tract population, and an even smaller percentage of the county total. This reflects the fact that very few persons actually reside on any of the project site lands.

For the Hillsboro Impoundment, the applicable census tract contains 6,555 total persons. Implementation of this component will involve the relocation of two households. Using a Florida average of 2.48 person per household (1998 Estimates of Housing Units; U.S. Census Bureau), only .01% of the population of the census tract will be affected. This is a very small impact. The other project sites contain no greater amount of persons being relocated, and there are more people living in the immediate census tracts. Therefore, the extreme case percentages of groups

being affected in other land acquisitions will not be greater than for the Hillsboro site. Impacts caused by the requirement for relocation will be very small.

There is a small amount of commercial infrastructure that will be affected by land acquisition. Most of this will be rock and sand mining in Hillsboro Impoundment area, and in the Broward County WPA area. This will cause a very minimal impact to rock and sand mining. There will also likely be a very small impact on employment for these sites, expected to most likely be short term, and very minimal. Similarly, some small nurseries will most likely close as a result of land acquisition, causing a very limited impact to the regional economy.

G.3.3 Regional Economic Impacts

The purpose of this part of the report is to estimate the regional economic consequences of WPA plan implementation. The main WPA implementation impacts on the 3-county (Palm Beach, Broward, and Miami-Dade) economy are expected to result from expenditures on construction and real estate. These impacts were estimated in the Comprehensive Review Study for the entire CERP project, using the 17-county overall project study area as the regional economic context. Although the expenditures for the whole CERP project are quite large, and are expected to result in fairly large regional economic impacts, these impacts are very, very small relative to the regional economy in which they will take place (on the order of 1/10th of one percent).

Expenditures on project construction and real estate represent an influx of money into the local economy. Spending has a ripple, or multiplier, effect throughout the economy that can be estimated using multipliers that have been calculated using the US Department of Commerce's Regional Input-Output Multiplier System (Bureau of Economic Analysis, RIMS II, 1992). RIMS II multipliers have been used to estimate the impacts during the construction period, estimated to result from construction spending, on employment, earnings and output (sales), in the 3-county WPA region. Real estate expenditures' regional impacts are of much greater uncertainty. Money spent for land acquisition may be reinvested in other land within the study area or the region, or it may be invested or spent outside the region, on land, investment, or consumption. Little is known about this, but since real estate spending is a relatively small part of the overall project costs, and since the regional impacts of the majority of the spending (construction) will produce relatively insignificant regional impacts, this is not a large concern. If there were significant agricultural production impacted by land acquisition for the WPA plan implementation, this would also be a concern that would require further investigation and analysis, but this is not the case. Therefore, there is reason to believe that project land acquisition represents a minor effect on the regional economy.

G.3.4 Overall Impacts: Output (Sales), Earnings, and Employment

The regional multiplier impacts of construction expenditures on gross output (sales), earnings, and employment were computed for each of the project sites. The following table outlines these impacts. The impacts are for the Lower East Coast 3-county area (Palm Beach, Broward, and Dade), and are broken down to show the effects associated with each site, and with the total sites for each county. But all of the impacts are for the entire 3-county area. The impacts represent the effects resulting from construction spending during project implementation and will occur during the construction period, expected to last from one to three years.

TABLE G.3-4 OVERALL REGIONAL ECONOMIC IMPACTS OF WPA CONSTRUCTION

Overall Regional Economic Impacts of WPA Construction					
County	Project	Construction Impacts			Project Costs ($1,000's)
		Output ($1,000's)	Earnings ($1,000's)	Employment (FTE)	
Broward	Sub-total	989,474	390,103	14,113	526,596
	C-11 Impoundment	276,685	109,084	3,946	147,251
	C-9 Impoundment	166,066	65,472	2,639	88,380
	Rest of Broward WPA	546,723	215,547	7,798	290,965
Palm Beach	Sub-total	110,795	43,682	1,580	58,965
	Hillsboro Impoundment	81,143	31,991	1,157	43,184
	Strazzulla Wetlands	29,652	11,691	423	15,781
Miami-Dade	Dade-Broward Levee, Central Lakebelt, and C-4 Structure	276,463	108,996	3,943	147,133
LEC Total		2,484,028	979,334	35,429	1,321,994

At first glance these look like enormous impacts resulting from construction spending to implement the various aspects of the project. When placed in the context of the Lower East Coast economy, though, these effects generally represent well below one percent of the total economic activity taking place in this region. The effects are large, to be sure, but the relative impact on the regional economy is quite small, mirroring the estimated regional impact of the overall CERP project documented in the Comprehensive Review Study.

G.3.5 RIMS Input-Output System Multipliers

The regional impacts described above have been estimated using information from the U.S. Department of Commerce's Regional Input-Output Modeling System (RIMS II), 1992. RIMS final demand multipliers provide a way to estimate the consequences of economic activity stimulated by project implementation. The types of economic impacts that a new project can have on output (sales), earnings, and employment in a region are known as "direct," "indirect," and "induced." Direct impacts are caused by the first round of expenditures for the project. The indirect impacts count the inputs that are purchased as a result of the first round expenditures. Indirect effects will vary in significance depending on the complexity of production in the study area and the degree to which required materials are supplied by local producers. Induced impacts are the cumulative economic effects that result from the spending of the workers' earnings. These three impacts combine to form the final demand impacts of a project in the study area. In this

case, the study area is defined as the Lower East Coast counties of Palm Beach, Broward, and Miami-Dade.

The three RIMS final demand multipliers are described below:

Output Multipliers - measure the dollars of total output (sales) generated in a defined geographic economy (the study area) for each dollar of product produced or delivered by a given industry.
Total regional impact output = Total Costs x Output Multiplier

Earnings Multipliers - measure the earnings/purchasing power that an industry generates, through its payroll and the multiplier effects, to members of households employed in the local economy study area.
Total regional impact earnings = Total Costs x Earnings Multiplier.

Employment Multipliers - measure the regional change in employment (full time equivalent [FTE]) generated in the regional impact area (the study area).
FTE regional impact = Total Costs/$1,000,000 x Employment Multiplier

In assessing the impacts presented in this report, the limits of the RIMS methodology should be recognized. The data used to develop the RIMS II multipliers are based on 1992 regional economic data. These data may not capture the variances in today's economy, but should provide a reasonable impact estimate. Proper use of the RIMSII 1992 multipliers requires that total cost estimates first be price-adjusted to 1992 price levels. This adjustment used a Corps of Engineers construction cost index. Next, the multiplier effects were calculated using these costs in 1992 prices along with the appropriate multiplier procedures described above. The resulting sales and employment regional impacts were then adjusted back to present day price levels using the most current CPI (Consumer Price Index) published by the Bureau of Labor Statistics, U.S. Department of Commerce. The employment impacts were not price adjusted, as these impacts are in full-time equivalent employment units, not dollars, and therefore do not change because of price changes.

RIMS multipliers are based on a formal and widely accepted national analysis of economic activity. The RIMS analysis provides a consistent method to quantify the economic impact of construction projects at the regional level. The RIMSII multipliers and CPI data used in this evaluation are described below:

1992 RIMS II Multipliers:
South Region (Palm Beach, Miami-Dade and Broward Counties)
Industry - 11.0703 (Conservation and development facilities, new)
Output Multiplier - 1.9141
Earnings Multiplier - .7545

Employment Multiplier - 34.2

Construction Index:
1992 - 422.05
2002 - 538.61

CPI:
1992 - 140.3
Jan 2001 - 175.8

Sample Calculations (for above tabulation of "Overall Regional Economic Impacts of WPA Construction") for the Broward County WPA C-11 Impoundment are delineated below:

Output Regional Impact
= (Cost) x (1992 Construction Price Index Adjustment Factor) x
(RIMSII 1992 Output Multiplier for Study Area) x (CPI Output Price Level Adjustment Factor)
= $147,251,000 x (422.05/538.61) x 1.9141 x (175.8/140.3)
= $147,251,000 x .78359 x 1.9141 x 1.253
= $147,251,000 x 1.879
= $276,685,000

Earnings Regional Impact
= (Component Cost) x (1992 Construction Price Index Adjustment Factor) x RIMSII 1992 Earnings Multiplier for Study Area) x (CPI Output Price Level Adjustment Factor)
= $147,251,000 x (422.05/538.61) x .7545 x (175.8/140.3)
= $147,251,000 x .78359 x .7545 x 1.253
= $147,251,000 x .7408
= $109,084,000

Employment Regional Impact:
= (Component Cost)/$1,000,0000 x (1992 Construction Price Index Adjustment Factor) x (RIMSII 1992 Employment Multiplier for Study Area)
= ($147,251,000 /$1,000,000) x (422.05/538.61) x 34.2
= 147.251 x .78359 x 34.2
= 147.251 x 26.8
= 3,946

G.3.6 Recreation

As previously discussed, recreation benefits have not been quantified. As a result, regional economic effects resulting from plan-induced recreational activity

have not been estimated. Recreation impacts are expected to be positive, but most likely will be too minimal to measurably affect the economy.

Benefits that could arise from recreation include the following:
- Properties that are adjacent to recreation areas often increase in value.
- Can provide stimulus for growth in the immediate area.
- Create a demand for jobs, sales, and service to tourists.

G.4 REFERENCES

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