

### III. Natural Resources of Regional Significance

#### 1. Overview

In 1995, the Natural Resources of Regional Significance Work Group developing the *Strategic Regional Policy Plan for South Florida* concentrated on the connectedness of natural resources, buffers from adjoining land uses, preservation of habitat areas, water allocation and quality, and public education. Other issues which may be considered of strategic regional importance, such as brownfields remediation, private sponsorship of public resources, and ecotourism opportunities were not discussed.

What we are finding, five years later, is that important strides are being made in natural resources protection, while some sources of stress to the environment continue unabated. Despite the pressure of a rapidly expanding population, in South Florida surface water quality and air quality have shown signs of improvement. Significant successes have been made with regard to land acquisition and habitat preservation. The need for ecosystem restoration, particularly with regards to the Everglades, is getting the attention of decision-makers at all levels of government and of the media. Nevertheless, Everglades restoration has not yet been accomplished and the funding is still not certain. Until this is resolved, the increasing population will hasten competition for fresh water between urban areas and the natural system. An increase in boat registrations may be one stress factor leading to the increase in manatee deaths. Greater automobile dependency may reverse improvements in air quality.

It seems South Florida is at a crossroads. The next five years will tell the story of whether or not our decision-makers will support continued efforts to conserve natural resources, or will permit the status quo of resource exploitation to render the environment, and the region's economy as a consequence, unsustainable.

#### 2. Assessment of Natural Resources Goals

##### Goal:

- 3.1 Eliminate the inappropriate uses of land by improving the land use designations and utilize land acquisition where necessary so that the quality and connectedness of Natural Resources of Regional Significance and suitable high quality natural areas is improved.

**Indicator:** Increase in the connectedness of the fragmented Natural Resources of Regional Significance and other suitable natural areas

through land acquisition and the enhancement or restoration of natural resource values.

**Proxy Indicator:** Acres of land described as natural/conservation areas in the local government comprehensive plans in the region

**Time Series Information:**

	1980	1985	1987	1990	1992	1995	2010
Broward			497680			499414	
Miami-Dade	639061	641196		750371			
Monroe					521908		
Region					1769959	1771693	

Sources: Broward, Miami-Dade and Monroe County local government comprehensive plans.

		1994	Proposed for Conservation	Total
Broward	Acres	483,626	5,681	489,228
	% of County	63.52%		
Miami-Dade	Acres	698,269	23,959	722,228
	% of County	56.33%		
Monroe	Acres	579,215	18,772	597,987
	% of County	91.46%		
Region		1,71,130	48,412	1,809,542

Source: FCMP - FACT

**Analysis**

Land described as existing natural/conservation areas in the county comprehensive plans have been increasing steadily in Miami-Dade and Broward. Broward and Miami-Dade have steadily increased natural/conservation areas since 1980. In Broward, 65% of the county's land area is in this category (mostly in the Water Conservation Areas). In addition to the Water Conservation Areas, wetlands of many types occupy 33% of the County's developable lands.<sup>1</sup> In Miami-Dade, most of it is in the WCAs and the two national parks. Miami-Dade increased its areawide parks to 1,270,736 acres in 1994. This was an increase of 423,647 acres from 1988.<sup>2</sup> Park expansion accounts for the majority of the increase. No reliable trends are available for Monroe County.

Other increases are also expected in Broward and Miami-Dade in the future as the East Coast Buffer is implemented, and in Monroe County as land is dedicated for conservation in order to receive Rate of Growth

Ordinance (ROGO) points. The designation of the Florida Keys National Marine Sanctuary will help to preserve our marine resources in Monroe County. Both Broward and Miami-Dade are actively pursuing countywide greenways systems. Miami-Dade County is in the process of implementing its approved plan. Broward County has funding and has begun work on a countywide greenways plan. It is anticipated that the secured funding source will provide funding for the initial implementation of the final plan.

In all three counties, the majority of the land is in conservation. The public is becoming more aware of these critical areas and participation in programs to preserve areas appears to be increasing. An example of this is the Miami-Dade County Environmentally Endangered Lands Program (EEL). Miami-Dade County voters approved a two-year property tax in 1990 to fund the acquisition, protection and maintenance of environmentally endangered lands. The State of Florida's Preservation 2000 program, which was succeeded by Florida Forever, has been an important source of matching funds for EEL. Florida Forever will go beyond Preservation 2000 by creating more direct citizen involvement, setting standards and measures, preserve water resources and create strong partnerships. Florida Forever is a \$3 billion program for the next ten years. The state will receive \$300 million each year through a bond program. It will be the most progressive land acquisition program in the country.

### **Implications**

As conservation areas expand, potential negative impacts to aquifer recharge and habitat availability should be reduced. However the availability of vacant land for development is also reduced, which will precipitate a crisis for development until the general public more readily embraces redevelopment of the urban core areas. This will also increase pressure to develop agricultural lands in southern Miami-Dade County. Additional funding will be needed to manage these natural areas.

### **Goal:**

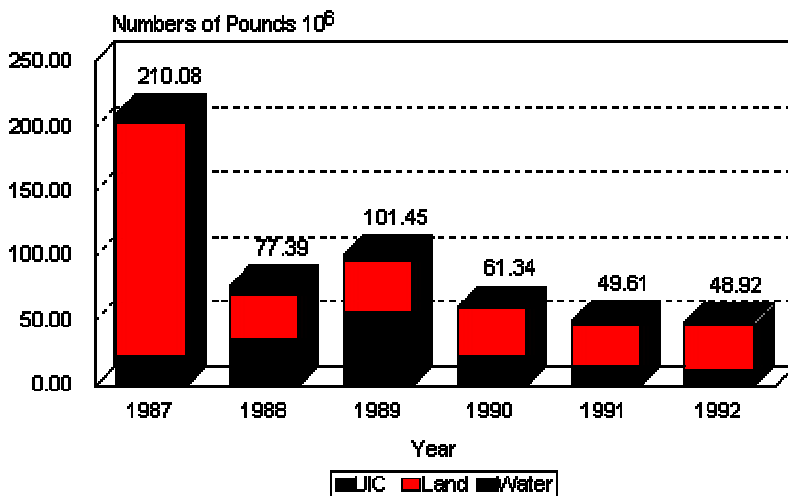
- 3.2      Develop a more efficient and sustainable allocation of the water resources of the region

**Indicator:** Reduction in the percentage of groundwater monitoring wells that show water quality exceedences.

**Proxy Indicator:** Total Pounds of Toxic Chemicals Annually Released to the Land and Water

### Time Series Information:

Total Pounds of Toxic Chemicals Annually Released to the Land and Water



Source: Strategic Assessment of Florida's Environment, USEPA, 1999

### Analysis

In the years since 1987, pounds of toxic chemicals released in the State of Florida annually through underground injection have decreased by almost 50% (22.6 million to 11.8 million). Pounds of toxic chemicals spilled onto the land decreased by about 85% (181 million to 34 million). Pounds of toxic chemicals spilled into surface waters decreased by about 50% (6.6 million to 3.3 million). Reports of hazardous materials spills in South Florida have decreased from 246 in 1994 to 172 in 1997.

### Implications

As the population continues to increase, diligence to reduce harmful chemical releases into the environment must also increase. However, this is one of the most encouraging trends regarding the environment at this time.

### Goal:

- 3.2 Develop a more efficient and sustainable allocation of the water resources of the region

**Indicator:** Reduction in the percentage of groundwater monitoring wells that show water quality exceedences.

**Proxy Indicator:** Total Fresh Water Withdrawals in Millions of Gallons per Day (MGD)

**Time Series Information:**

	1970	1980	1990	1995	2020
<b>MGD</b>	462.40	678.98	808.79	854.56	1,120.22
<b>POP</b>	1,940,480	2,706,960	3,240,740	3,540,172	4,620,000
<b>GD/POP</b>	238	251	250	241	242

Sources: USGS, SFWMD

**Analysis**

Total withdrawals, from both surface waters and aquifers, show reduced per capita use of freshwater from 251 gallons per day in 1980 to 241 gallons per day in 1995. Water conservation efforts among end users may be responsible, as well as better monitoring and repair to the distribution systems. Per capita water consumption is projected to increase by one gallon per day by the year 2020. As population grows, so too does water demand. If the projections are correct, this could lead to increased competition between urban and agricultural use and the natural system for fresh water resources.

**Implications**

Increased withdrawals can lead to water shortages in drought years, decreased spatial extent and viability of wetland habitat, and saltwater intrusion to the aquifer. However, if water drained to tide could be utilized, increased withdrawals could be accommodated without further harm to the environment.

**Goal:**

3.2 Develop a more efficient and sustainable allocation of the water resources of region.

**Indicator:** Elimination of direct discharge of untreated water into surface waters, or into the ground which then flows into surface waters, including stormwater.

**Proxy Indicator:** Number of Onsite Sewage Treatment and Disposal Systems Installed.

### **Time Series Information:**

	1980	1985	1990	1995	1996
Broward	785	526	267	294	100
Miami-Dade	n/a	2,950	1,703	1,862	758
Monroe	649	505	712	164	199

Source: Florida Department of Health, Onsite Sewage Program (ARPC)

### **Analysis:**

All three counties have had a decrease in the number of onsite sewage systems installed. Sewer systems have been expanded.

### **Implications:**

More efficient processing of waste and a cleaner natural environment.

### **Goal:**

- 3.3 Achieve improved air quality throughout the region through a reduction of transportation related impacts and the increased use of natural plantings.

**Indicator:** Increase the number of days per year that the air quality index meets or exceeds the good range.

### **Analysis**

In 1995, South Florida's air pollution status was changed from a non-attainment area for ozone pollution to a maintenance area. This means that air quality with regard to this one chemical improved to within standards considered healthy by the U.S. Environmental Protection Agency. The region's air quality is not good enough, however, to be labeled as an attainment area. Reasons for the improvement include the success of the automobile emissions inspection program, improved fuel efficiency in automobile and aircraft engines, and the closing of Homestead Air Force Base. Increasing use of the automobile, especially longer commutes, coupled with the region's rapidly increasing population, and increasing political pressure to discontinue the inspection program may reverse the trend of improving ozone pollution in the future.

### **Implications**

Ozone pollution causes respiratory problems, particularly for the elderly, children, and people with asthma. It also contributes to the deterioration of building materials. Non-attainment status, should it return, would

cause increased regulatory scrutiny which may raise obstacles to economic development.

**Goal:**

- 3.4 Improve the protection of upland habitat areas and maximize the interrelationships between the wetland and upland components of the natural system.

**Indicator:** Annual overall reduction in the exotic plants and animals of the region.

**Proxy Indicator:** Acres of native plants

**Analysis**

The quality of our wildlife habitat is declining throughout the region. Florida's old forests are being replaced with single species. These new forests lack the wildlife value of their predecessors and have considerably less wildlife utility. For example, Pine Rocklands are rare associations of slash pines and tropical plants found nowhere else except the South Florida region. Sixty-seven animals and plant species have been found in this habitat type. This community originally covered approximately 382,000 acres, but development in the region has reduced the total to less than 21,000 acres, a reduction of more than 94% of the original habitat area.<sup>3</sup>

Tropical hardwood hammocks have been devastated by development. For example, the once pristine Brickell Hammock has been reduced to less than 50 acres. Miami Rock Ridge hammocks have been fragmented and isolated from surrounding natural communities due to massive urban and rural development. Exotic plant species have also had a negative impact on tropical hardwood hammocks. The majority of the remaining tropical hardwood hammocks outside of the Florida Keys have been acquired and are no longer threatened by development. The Keys has approximately 11 acres of tropical hardwood hammock in private ownership making these areas susceptible to development and invasion by exotic plants.

**Goal:**

- 3.5 Develop a plan for public access that delineates the Natural Resources of Regional Significance and high quality natural areas compatible with human recreation and promotes the ecologically sensitive use of Natural Resources of Regional Significance and high quality natural areas.

**Indicator:** Increase in the use of natural areas for educational purposes

**Proxy Indicator:** Number of Registered Recreational Vessels

**Time Series Information:**

	1987-88	1990-91	1993-94	1996-97
Broward	38,090	39,791	40,917	41,061
Miami-Dade	47,871	47,082	45,132	50,213
Monroe	14,180	15,679	16,895	18,658

Source: Department of Highway Safety and Motor Vehicles, Bureau of Vessel Titles and Registrations (ARPC)

**Analysis:**

All three counties have had a slight increase in the number of registered vessels over the last ten years.

**Implications:**

Additional impacts to natural resources, increase in tax dollars and registration fees and more marine related jobs.

**Goal:**

- 3.5 Develop a plan for public access that delineates the Natural Resources of Regional Significance and high quality natural areas compatible with human recreation and promotes the ecologically sensitive use of suitable Natural Resources of Regional Significance and high quality natural areas.

**Indicator:** Increase in the number of miles of hiking trails within the region by 2000

**Proxy Indicator:** Number of miles of hiking trails in the region

**Analysis**

Since the adoption of the SRPP, Miami-Dade County has completed two plans for greenways systems (one each for the south and north parts of the county). Broward County has begun a planning process for a county-wide greenways system that should be completed in 2001. All three systems are expected to connect with the statewide greenways system.



### **Implications**

Greenways offer opportunities for recreation, alternative transportation, habitat restoration and wildlife movement. They can also be used as economic development tools for eco-tourism or when connected to business districts.

### **Goal:**

- 3.6 In order to improve natural system quality and extent and to improve the connectedness of the natural system, achieve an increased level of funds set aside for the acquisition, protection, restoration and maintenance of the Natural Resources of Regional Significance and suitable adjacent natural areas.

**Indicator: Increase of habitat mitigation areas located within Natural Resources of Regional Significance and other suitable natural areas.**

**Proxy Indicator: Acres of conservation lands. (See Goal 3.1)**

**Analysis (see analysis under Goal 3.1)**

### **Goal:**

- 3.7 Educate South Floridians to achieve an increased awareness of the natural system and of its significance with respect to the overall regional system.

**Indicator: Increase the number of regional symposia by 20 percent by the year 1998 on the importance of Natural Resources of Regional Significance and other suitable natural areas.**

### **Analysis:**

Since the SRPP was adopted in 1995, public awareness of the environment and the importance of natural resources of regional significance have increased significantly, principally through increased media attention. A steady stream of political debates over the remainder of the natural system in South Florida has taken place. Such issues as Everglades restoration, seagrass die-offs in Florida Bay, a tax on sugar, ship groundings on coral reefs, the sewer pipe rupture, land acquisition in the 8½ square mile area, widening U.S. Highway 1 along the 18 mile stretch, peat fires, carrying capacity of the Florida Keys, and drowned deer have all grabbed the headlines, increasing public awareness of the

fragile ecosystem in which we live. Some of this attention has been negative. Various non-profit or private-sector organizations are affecting public awareness in positive ways, such as the Dade Green Coalition, the Greater Miami Chamber of Commerce, and the Biscayne Bay Foundation.

**Implications:**

Public awareness of environmental issues often translates into political will for conservation. This political will, if translated into more resources for the environment should benefit wildlife, human health, and a stronger eco-tourism sector of the regional economy.

**Goal:**

3.8 Enhance and preserve natural system values of south Florida's shorelines, benthic communities, fishery, and associated habitat.

**Indicator:** Increase in beach miles vegetated by native species.

**Proxy Indicator:** Miles of critically eroding shoreline.

**Time Series Information:**

	1989	1990	1991	1992	1993	1997-98
Broward	18.2	18.2	18.2	18.2	18.2	*21.3
Miami-Dade	16.9	16.9	16.9	17.4	17.4	*17
Monroe	4.6	4.8	4.8	4.8	4.8	*7.3

Source: Florida Department of Environmental Protection (ARPC)

1989 - 1993: Critical erosion areas are segments of the shoreline where substantial development or recreational interests are threatened by erosion.

\*1999: Critical erosion areas are segments of the shoreline where substantial development, recreational interests, historical resources or natural habitat are threatened by erosion. FDEP expanded its definition of critical areas in the 1997-98 survey.

**Analysis:**

Miles of critically eroding shoreline remain essentially unchanged from 1989 to 1993 and increased in Broward and Monroe Counties based on the expanded definition during 1997-98.

**Implications:**

More needs to be done to prevent erosion and protect coastal structures.

**Goal:**

3.8 Enhance and preserve natural system values of south Florida's shorelines, benthic communities, fishery, and associated habitat.

**Indicator:** Increase in sea bottom covered by seagrasses.

**Proxy Indicator:** Manatee Deaths

**Time Series Information:**

	1977-81	1982-86	1987-91	1992-96	*1998
Broward	17	21	19	28	7
Miami-Dade	40	18	31	47	9
Monroe	36	19	19	28	5
TOTAL	93	58	69	103	21

Source: Florida Marine Research Institute (ARPC) and Division of Marine Resources

\*All time periods are for 4 years except for 1998.

**Analysis:**

There has been a slight increase in the number of manatee deaths over the last twenty years. Data on total populations would be useful.

Seagrass communities are the primary food source for manatees. Propeller scarring and seagrass die-offs are an indication of the health of the manatee population. Seagrass communities continue to die off due to water quality degradation, dredge/fill activities and propeller scarring. This habitat is a valuable nursery habitat because it provides both food and shelter. In 1987, a massive mortality of seagrasses occurred impacting over 18 percent of the total Florida Bay area. The rate of seagrass "die-off" accelerated in 1992. As a result of the seagrass die-off, the pink shrimp harvest in Florida Bay decreased from ten million pounds in 1986 to four million in 1987, a decline of 60 percent.

It is anticipated that updated information on the health of seagrass communities will be available in the near future. In the summer of 2000, the Florida Fish and Wildlife Conservation Commission and the US Environmental Protection Agency will begin a full-scale seagrass sampling as part of the Inshore Marine Monitoring and Assessment Program. Seagrass community composition will be assessed with two methods: a visual examination of % cover occupied by each species; and a core sample in which seagrasses and the underlying sediment are returned to the lab for detailed analysis.

### **Implications:**

More needs to be done to prevent manatee deaths.

### **Goal:**

3.8 Enhance and preserve natural system values of south Florida's shorelines, benthic communities, fishery, and associated habitat.

### **Indicator:**

### **Proxy Indicators: Commercial Saltwater FinFish Landings and Coral Reef Habitat**

### **Time Series Information:**

	1961	1966	1971	1976	1981	1986	1991	1996
Broward	65,255	37,769	5,463	1,326	n/a	1,981,248	2,685,874	1,046,496
Miami-Dade	976,271	598,416	569,847	615,125	n/a	715,340	1,098,452	875,224
Monroe (lbs.)	5,313,572	7,233,353	6,303,702	11,752,563	8,550,068	8,254,620	8,424,088	8,620,667

Source: National Marine Fisheries Service, *Summary of Florida Commercial Marine Landings*

### **Analysis:**

Monroe County landings peaked in 1976 at 11,752,563 lbs., since this time they have been around 8,500,000 lbs. Broward County landings dropped drastically until 1986. 1986 and 1991 were the most productive years peaking at 2,685,874 in 1991. Landings dropped to 1,046,496 in 1996, the third highest recorded total. Dade County landings also dropped until 1986 and peaked in 1991 at 1,098,452 lbs. 1996 numbers showed a decrease to 875,224 lbs. The increase in finfish landings could be due to more efficient equipment or an increase in fishing fleets.

The quantity and quality of fish stocks is directly related to the health of the region's coral reef system. Coral reefs are threatened wherever they are close to large concentrations of people and coral reefs are in decline. There are well-documented reports of local declines in coral populations from monitoring, but there is uncertainty about the extent of these changes. Unfavorably warm conditions during long lasting summer doldrums have been linked to coral bleaching and unusually cold weather has also killed off large portions of the tract. Evidence is growing that freshwater management practices as far north as Lake Okeechobee are having serious effects on coral reef health and coral recruitment. Some trends related to south Florida's reef habitat are easy

to quantify such as fish populations. For example, in 1997, snapper and grouper populations were below critical population levels.

**Implications:**

Over fishing may harm the resource. What impact will the Florida Keys National Marine Sanctuary (KNMS) have on Monroe County landings?

**Goal:**

3.9 Restore and protect the ecological values and functions of the Everglades System.

**Indicator: Increase in the acres of water storage/buffer zones within urban areas.**

**Analysis**

Since the adoption of the SRPP, the Governor's Commission for a Sustainable South Florida issued its Initial Report, the Everglades Forever Act was signed, the Florida Department of Environmental Protection has adopted an ecosystem management approach, and the Central and Southern Florida Project has been reevaluated to determine how the functioning of natural areas throughout the region can be improved. Environmental policies and programs are being more thoroughly accepted which may assist nature to repair human-induced damage to the ecosystem in South Florida.

- The National Pollution Discharge Elimination System (NPDES) program is making progress on the reduction of direct discharges of sewage and stormwater runoff from urban areas into surface waters. This program is gaining acceptance among local governments and is being reflected in development regulations and retrofit programs.
- Planned changes to the Central and Southern Florida Project include aquifer storage and recovery (ASR) systems that should reduce water wasted to tide in the rainy season through underground storage to be extracted later in the dry season.
- Another planned change to the Central and Southern Florida Project is an increase in surface water storage and stormwater treatment areas (STAs) between the urban and natural areas. These will serve the two-fold purposes of storing fresh water for release in drought years and cleaning chemicals and excess nutrients out of water to be returned to the natural system.

### **Implications**

Expect improvements to surface water quality throughout the region due to NPDES. Despite the expected population growth, ASR, if successfully implemented, could be a factor towards reduced competition for fresh water resources between urban and agricultural uses and the natural system. Expect greater balance in hydroperiods and improved water quality in natural areas due to STAs.

### **End Notes**

1. Broward County. 1995 *Evaluation and Appraisal Report*.
2. Miami-Dade County. 1995 *Evaluation and Appraisal Report for the Recreation and Open Space Element*.
3. Cox, J., Kautz, R., MacLaughlin, M., and Gilbert, T. 1994. *Closing The Gaps in Florida's Wildlife Habitat Conservation System*. Florida Fish and Wildlife Conservation Commission, Office of Environmental Services. Tallahassee, Florida.