

An Integrated Plan For SouthFlorida Ecosystem Restoration and Sustainability

SUCCESS IN THE MAKING

PREPARED BY THE WORKING GROUP OF THE SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE

SUMMARY

CONTENTS

INTRODUCTION

- Expanding the Concept of Ecosystem
- Why Should We Care?

HOW DID WE GET HERE?

- A Special Place — At Risk
- The Other Side of the Coin
- An Ecosystem in Decline
- Roots of Degradation
- Consequences

IS ANYBODY DOING ANYTHING?

- Protecting Land and Water
- Enacting Laws and Initiatives
- Changing Land Use Patterns
- Forming Partnerships
- A Common Vision

WHAT ARE THE GOALS?

- Goal 1: Get the Water Right
- Goal 2: Restore and Enhance the Natural System
- Goal 3: Transform the Built Environment

HOW DO WE ACHIEVE THE GOALS?

- Adaptive Management
- Innovative Management

WHAT'S BEING DONE?

- Getting the Water Right
- Restoring and Enhancing the Natural System
- Transforming the Built Environment

ARE WE THERE YET?

- Lessons Learned
- Shared Responsibilities
- The Next Step
- The Buy InWise Investments

GLOSSARY

ACRONYMS

SOURCES

WEB SITES

SOUTH FLORIDA ECOSYSTEM RESTORATION TASK FORCE

SOUTH FLORIDA ECOSYSTEM RESTORATION WORKING GROUP

SPECIAL ADVISORS

THE GOVERNOR'S COMMISSION FOR A SUSTAINABLE

SOUTH FLORIDA

ORGANIZATION

| [Contents](#) | [Summary](#) | [Introduction](#) | [How Did We Get Here?](#) | [Is Anybody Doing Anything?](#) | [What Are The Goals?](#) | [How Do We Achieve The Goals](#) | [What's Being Done?](#) | [Are We There Yet?](#) | [Glossary](#) | [Acronyms](#) | [Sources](#) | [Web Sites](#) | [South Florida Ecosystem Restoration task Force](#) | [South Florida Ecosystem Restoration Working Group](#) | [Special Advisors](#) | [The Governors Commission For A Sustainable South Florida](#) | [Organization](#)

SUMMARY



What:

The South Florida Ecosystem Restoration and Sustainability project consists of nearly 200 environmental restoration, growth management, agricultural, and urban revitalization projects, programs, and initiatives that are designed to make South Florida more sustainable in the future.

Goals

- restore the natural hydrology of South Florida
- enhance and recover native habitats and species
- revitalize urban core areas to reduce the outward migration of suburbs and improve the quality of life in core areas

Premises

- on their current courses the natural and built environments of South Florida are not sustainable
- the environment, society, and economics of South Florida are not discrete systems but are related interlinking subsystems that make up the South Florida ecosystem

Vision

- a landscape whose health, integrity, and beauty is restored and is nourished by its interrelationship with South Florida's human communities

Who:

Participants in the restoration effort include

- six federal departments (12 agencies)

- seven agencies and commissions of the state of Florida
- two American Indian tribes
- 16 counties and scores of municipal governments
- representatives from major state industries• commercial and private sectors
- special interest groups

Restoration activities are generally guided and coordinated by the South Florida Ecosystem Restoration Task Force, its Florida-based Working Group, various advisory boards (e.g., the Governor's Commission for a Sustainable South Florida), and other technical working groups (e.g., the Science Coordination Team, Public Outreach Steering and Support Team, and project coordination teams). These entities interact and cooperate with one another through federal and state mandates, formal agreements, treaty and trust responsibilities, ordinances, partnerships, and coalitions.

Where:

The ecosystem restoration project area extends from the Chain of Lakes south of Orlando to the reefs surrounding historic Fort Jefferson southwest of the Florida Keys. The area encompasses all the terrestrial and aquatic habitats in this area. It also includes the metropolitan areas of Miami, Fort Lauderdale, West Palm Beach, Fort Myers, and other growing communities in South Florida. As defined the ecosystem covers approximately 10,800 square miles (28,000 square kilometers) and includes 11 major physiographic provinces.

Why:

Water is the common lifeline for the natural and built environments. Engineered flood control and water distribution systems, agriculture, growth, and development have disrupted the region's water quality, quantity, timing, and distribution (i.e., the hydropattern). Agricultural runoff and urban stormwater have introduced high levels of phosphorus, mercury, and other contaminants into the water system, polluting lakes, rivers, estuaries, and the Everglades. Abnormally high discharge of stormwater into estuaries and coastal waters has severely degraded aquatic habitats that support fish, birds, and other species. Groundwater is threatened by saltwater intrusion and other marine-induced pollutants. These impacts have significantly stressed the natural system. Evidence of these impacts include

- 50% reduction in the original acreage of the Everglades
- 90%–95% decrease in wading-bird populations
- 68 threatened or endangered species
- 2 million acre-feet of water lost from the system through discharge annually
- 1 million acres of the ecosystem under health advisories

from mercury contamination

- phosphorus contamination of Lake Okeechobee, the Everglades, and surrounding wetlands
 - the rampant spread of invasive, exotic plants and the displacement of native species
- Rapid population increase, development, and urban sprawl along the state's coastal areas have similarly stressed the built environment.

Agricultural areas in the interior face related problems stemming from growth and urban sprawl. Indicators of stress in the built environment include

- 16% reduction in agricultural lands
- high numbers of sites contaminated by hazardous materials (brownfields)
- greater unemployment, lower income and education levels, and a high prevalence of poverty in urban cores
- repetitive water shortages and salt water intrusion
- increased demands for roads, utilities, and services in response to the outward growth of suburbs
- decreased tax bases in urban cores / overly stressed infrastructures

How:

Restoration efforts are guided by three linked strategies.

Adaptive Management. Restoration participants recognize that not all the data needed to restore the ecosystem is in hand. They also recognize the need to move forward. Therefore, restoration efforts employ an overall strategy that implements action where possible, while continuing to collect and refine data. This iterative, feedback approach, termed adaptive management, relies heavily on predictive modeling and support studies to identify management alternatives and evaluate their potentials. It also employs extensive monitoring to assess the progress of management actions and to provide feedback for refining both restoration actions and predictive models. This approach provides the structure for initiating critical projects immediately, the flexibility to modify activities when needed, and the coordination to ensure accountability.

Innovative Management. The restoration effort further recognizes that decisions must be based on sound science. Yet, science alone is not the answer. Using systemwide management techniques that deal with issues holistically, are outcome-oriented, and overcome institutional barriers are also important. Because the ecosystem does not recognize governmental jurisdictions, successful restoration efforts must also employ integrated governance to coordinate the activities of federal, state, tribal, regional, and local governmental entities and to find ways to streamline management and

funding. Finally, broad-based partnership and public outreach are essential for building a consensus on needed actions and for maintaining good lines of communication with the public and among restoration partners.

Action. Critical projects are underway to restore the regional hydropattern, recover endangered species and habitats, and revitalize urban cores and manage growth. Projects like the Kissimmee River Restoration Project, Everglades Construction Program, and the Water Preserve Areas Project demonstrate that more natural hydropatterns can be reestablished. The Multi-Species Recovery Project underscores the need to address issues holistically and on a regionwide basis. The innovative Eastward Ho! Initiative shows how public, private, and governmental entities can work together to breathe new life into urban areas and foster more sustainable lifestyles. Finally, the South Dade Land Use / Water Management Planning Project and the Florida Keys Carrying Capacity Study provide excellent examples for a more sustainable future. These ambitious projects show that a sustainable South Florida can become a reality.

When:

Now, and the next 50 years. Reestablishing a healthy and sustainable ecosystem, including both the natural and built environments, is a massive undertaking that will take decades to complete and will require long-term funding commitments. The progress made to date shows that the current methods work and will continue to be improved. Ultimate success will depend on continued consensus and cooperation among restoration partners, shared responsibilities, and consistent funding. Restoring the South Florida ecosystem will secure the future of South Florida and will provide valuable examples of restoration methods and strategies that can be applied elsewhere.

| [Contents](#) | [Summary](#) | [Introduction](#) | [How Did We Get Here?](#) | [Is Anybody Doing Anything?](#) | [What Are The Goals?](#) | [How Do We Achieve The Goals](#) | [What's Being Done?](#) | [Are We There Yet?](#) | [Glossary](#) | [Acronyms](#) | [Sources](#) | [Web Sites](#) | [South Florida Ecosystem Restoration task Force](#) | [South Florida Ecosystem Restoration Working Group](#) | [Special Advisors](#) | [The Governors Commission For A Sustainable South Florida](#) | [Organization](#)

INTRODUCTION



South Florida is in trouble. The once lush, subtropical wetlands and coastal reefs are dying, while the vibrant tourist meccas are marred with "brownfields" and urban sprawl. The entire ecosystem is in jeopardy.

But there is good news. Massive efforts to cleanse and restore the natural flow of water through the region — the key to the health of the entire system — are underway. Similarly, innovative measures for improving the quality of life in urban centers and reining in urban sprawl are being explored and implemented. Increasingly, a shared understanding and a common goal are taking root among politicians, government officials, tribes, farmers, ranchers, business leaders, and private citizens. We must make South Florida sustainable. We must do it now. And we must do it together.

EXPANDING THE CONCEPT OF ECOSYSTEM

The ecosystem is the key to the future of South Florida. Once the term raised visions of only the natural environment, including all the plants and animals and their intricate relationships with their physical surroundings. But the South Florida ecosystem is also home to humans and their built environment. Today, we have come to realize that all aspects of life, including humans and their built world, are inextricably linked.

Clean air and water, healthy habitats, and viable species populations are critical to the overall health of the ecosystem. But so are sound economies, affordable housing, and job opportunities. Both the natural and the built environments are two sides of the same coin. Attempting to deal with the problems of one, and not the other, will never be successful. Actions and strategies must be directed at the totality of the relationships that exist between the built environment, the natural world, and all the collective inhabitants.

This expanded view of the South Florida ecosystem is daunting and complex. It forces planners, scientists, and the public to view the built environment and the

In Florida, the environment is the economy.

— Al Gore, Vice President

December 1997

resources needed to support it as part of a larger system. Rather than dealing with issues independently, the challenge is to seek out the interrelationships and mutual dependencies that exist between these critical components of the ecosystem.

Dealing with the problems of both the built environment and the natural system is new and challenging. The problems and solutions touch every aspect of life in the region. Unless a holistic, integrated, and adaptive approach is taken, and taken at all levels, the root problems will not be addressed.

WHY SHOULD WE CARE?

The quality of life in South Florida depends directly on the health and vitality of the natural system. Fishermen and divers cannot continue to do business if the coral reefs, estuaries, and shallow waters of Florida Bay cannot support viable populations of aquatic species and healthy habitats.

Sugarcane producers, winter vegetable farmers, and ranchers will find it harder to produce safe and reliable food crops if more fertile soil continues to be lost to subsidence and farmland continues to be converted into housing, condominium complexes, and urban landfills.

Likewise tourism, international trade, transportation, and the service sector will suffer if South Florida ceases to possess the natural aesthetics and beauty that make the region such a popular destination for visitors around the world. Reduced economics, in turn, will impact urban infrastructure and public safety — as well as the region's ability to support tourism, trade, and other vital industries.

Every resident and visitor in the region has a stake in the final outcome. The challenge is to find ways to reconcile human demands with the needs of the natural environment.

| [Contents](#) | [Summary](#) | [Introduction](#) | [How Did We Get Here?](#) | [Is Anybody Doing Anything?](#) | [What Are The Goals?](#) | [How Do We Achieve The Goals](#) | [What's Being Done?](#) | [Are We There Yet?](#) | [Glossary](#) | [Acronyms](#) | [Sources](#) | [Web Sites](#) | [South Florida Ecosystem Restoration task Force](#) | [South Florida Ecosystem Restoration Working Group](#) | [Special Advisors](#) | [The Governors Commission For A Sustainable South Florida](#) | [Organization](#)

HOW DID WE GET HERE?

A SPECIAL PLACE — AT RISK

The river of grass so elegantly described by Marjory Stoneman Douglas epitomizes much of the natural component of the South Florida ecosystem — but not all of it. The natural system extends from the Chain of Lakes south of Orlando to the reefs surrounding historic Fort Jefferson southwest of the Florida Keys. Originally, water in this system flowed freely over low-lying lands and into coastal estuaries. This expansive "river" covered almost 11,000 square miles, creating a mosaic of ponds, sloughs, sawgrass marshes, hardwood hammocks, and forested uplands. In and around the estuaries, freshwater mingled with salt to create habitats supporting mangroves and nurseries for wading birds and fish. Beyond, near-shore islands and coral reefs provided shelter for an array of terrestrial and marine life. For thousands of years these intricate relationships evolved into a finely balanced system that formed the biological infrastructure for the southern half of the state.

This unique system has three main characteristics. First, it is very flat. Across the 100 miles between Lake Okeechobee and Florida Bay there is less than a 20-foot drop in elevation. Second, the system extends over an enormous spatial area and contains varied flora, fauna, and physical landscapes. Third, and most important, it is a water-dominated, rain-driven system characterized by dynamic water storage and the shallow sheetflow of water.

These factors combine to create an environment containing some of the greatest biodiversity found on earth. Wetlands, estuaries, and shoals exist elsewhere. But nowhere in the world do they combine in the unique way that is found in South Florida.

THE OTHER SIDE OF THE COIN

Because of its natural assets, the region historically has attracted newcomers. The warm weather and sandy beaches beckoned tourists, while the fertile soils of the glades — once drained — made vast areas available to food production. Trains, and later cars and aircraft, made the region more accessible to visitors. Air conditioning made South Florida more inhabitable for full-time residence. Seaports and sparkling water added

The entire ecosystem, natural and built, is in peril. The system is precariously perched between survival and destruction — and the pressures are increasing.

— South Florida Ecosystem Restoration Working Group 1997

Current Stress Indicators: The Natural System

- 50% of the original Everglades has been drained
- populations of wading birds have dropped by 90%–95%
- 68 plant and animal species are threatened or endangered
- 2 million acre-feet of water are lost from the natural system annually through discharge and unnatural seepage
- 1 million acres of the ecosystem are under health advisories for mercury contamination
- phosphorus from agricultural runoff has contaminated Lake Okeechobee, the Everglades, and surrounding wetlands
- increased unnatural discharges of freshwater have damaged coastal estuaries
- the incidence of coral diseases has increased 10-fold since 1980
- over 1.5 million acres are infested

another dimension. The area attracted money as well as people, giving rise to other growth industries — and to a high quality of life. For much of the 20th century, Fort Myers, Miami, Fort Lauderdale, and Palm Beach were the places to be.

Today almost 5 million people reside on the east coast of South Florida alone, and by 2050 the number is expected to rise to 12 million. Urban areas located mainly along the coast now support a staggering array of human sights, sounds, cultures, and economies. Development and growth have transformed large tracts of wetlands, native rangelands, and upland habitat into cropland and housing developments. Urban centers support national and international commerce and related industries, such as tourism and fishing. Growing ethnic neighborhoods underscore the region's role as a place for immigrants to seek new lives.

AN ECOSYSTEM IN DECLINE

The dramatic increase in population — and its associated development — have greatly strained the natural system. Half of the original wetlands are gone due to drainage, and many of the remaining natural habitats are significantly altered and disconnected from each other by canals, roads, and other man-made features. Urban stormwater and past agricultural practices have polluted Lake Okeechobee and disrupted the balance of nutrients in wetland areas to the south. Each year, 2 million acre-feet of water are being lost from the natural system through direct discharge of agricultural and urban stormwater into estuaries and from unnatural seepage. Areas that historically supported numerous tropical and neotropical plants and animals are now dominated by invasive, exotic species.

On the other side of the coin, urban and suburban areas in Miami-Dade, Broward, and Palm Beach Counties, as well as rapidly growing west coast communities, face equally severe problems — crime, social and ethnic tension, under employment, environmentally contaminated sites (brownfields), and recurring water shortages. The enviable quality of life of South Florida is at risk.

ROOTS OF DEGRADATION

The roots of ecosystem degradation lie mainly in human attitudes. Early land developers viewed the Everglades and its related habitats as worthless swamps. The dream of reclaiming the swampland took hold in the first half of the 1800s. Initial efforts were largely ineffectual, but

with invasive, exotic plants

Current Stress Indicators: The Built System

- South Florida agricultural lands have decreased by 10.7 million acres or 16%
 - by the year 2050, South Florida's population will increase threefold, from 5 million to 15 million
 - the east coast of South Florida has thousands of sites contaminated by hazardous materials (brownfields)
 - the eastern urban corridor of South Florida is characterized by lower income levels and lower home ownership rates than the surrounding suburbs
 - the city of Miami is ranked as the fourth poorest city in the nation
 - Miami-Dade County has the highest unemployment rate in the state of Florida
-

the no-tion of draining the vast wetland for agriculture and development persisted. Little by little, canals, roads, and buildings displaced native habitats.

The Central and Southern Florida (C&SF) Project realized the vision of early developers on a massive scale. Work started in 1950 and resulted in the construction of almost 2,000 miles of canals and levees, over 200 control and diversion structures, 25 navigational locks, and 56 railroad bridges. Two of the project's purposes, and benefits, were to: (1) provide water and flood protection for urban and agricultural lands and (2) ensure a water supply for Everglades National Park.

When completed, the C&SF Project opened the doors for unprecedented growth. It also resulted in the alteration, and in some cases, the destruction of the region's hydropattern — the quantity, timing, and distribution of water flow through the ecosystem.

This project arose in response to public outcries for flood control. Historically, the natural system absorbed excess water during wet seasons and served as a reservoir during dry periods. Drainage of wetlands and the construction of canals curtailed this moderating effect, resulting in a series of devastating floods and droughts that were further exacerbated by unusually powerful hurricanes during the first half of the century. These catastrophic events led to a public demand for man-made flood protection. In short, there was greater security and confidence in the built world. Also, there was an increasing perception that the natural environment and the built environment were separate entities.



The channeling of the Kissimmee River during the C&SF Project resulted in the drainage of two-thirds of the historical floodplain and the loss of habitat for many now threatened and endangered

species.

The C&SF Project still provides its intended benefits of supplying water and flood control. However, many of the project's under-estimated or unanticipated side effects laid the foundation for ecosystem degradation. These negative consequences stemmed not only from public attitudes toward the natural environment, but also from the desire to find quick solutions to complex problems.

Similar attitudes directed the growth and development of the built environment. At the turn of the century, there was a frontier mentality and a general lack of understanding of the value of wetlands. Land was for the taking, and when resources were exhausted, it was time to move on. A pattern of outward growth emerged, leading to ever-expanding suburbs and declining urban cores. The desire for quick solutions also led to simplistic solutions for complex social and economic problems like employment, housing, education, and infrastructure — problems that increasingly fueled the flight from urban cores into the fragile natural areas and agricultural lands.

CONSEQUENCES

After almost 50 years of manipulation, much of the natural system is out of balance. The built environment and its inhabitants are on a similar track. On its present course, South Florida is not sustainable.

The urgency of this situation is overshadowed only by the scope and complexity of the problems that have given rise to it. Continuing to seek short-term solutions, viewing problems piecemeal, and failing to balance the needs of the natural and built environments have produced serious consequences. Developing systemwide solutions that address the underlying causes of problems is far more difficult, costly, and time consuming. But it may be the only viable alternative. Ultimately, the fate of South Florida rests with public attitudes and the actions we are willing to take.

| [Contents](#) | [Summary](#) | [Introduction](#) | [How Did We Get Here?](#) | [Is Anybody Doing Anything?](#) | [What Are The Goals?](#) | [How Do We Achieve The Goals](#) | [What's Being Done?](#) | [Are We There Yet?](#) | [Glossary](#) | [Acronyms](#) | [Sources](#) | [Web Sites](#) | [South Florida Ecosystem Restoration task Force](#) | [South Florida Ecosystem Restoration Working Group](#) | [Special Advisors](#) | [The Governors Commission For A Sustainable South Florida](#) | [Organization](#)