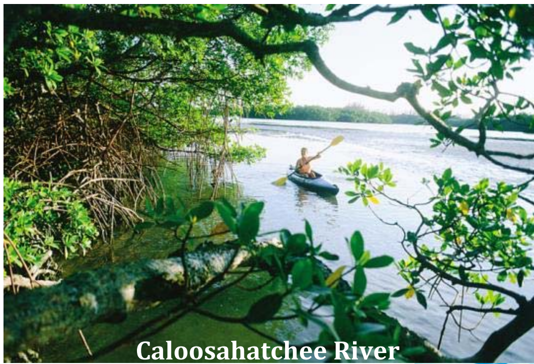
Caloosahatchee River


Florida Bay


St. Lucie River

THE ECONOMICS OF THE EVERGLADES WATERSHED AND ESTUARIES

Phase I -- Review of Literature and Data Analysis


The Everglades Waterways

Center for Urban and Environmental Solutions at Florida Atlantic University

Photos:
Caloosahatchee River – cache.boston.com/.../10/1207873158_5162/539w.jpg, Lee County Visitor and Convention Bureau
Florida Bay - http://www.aslo.org/photopost/showphoto.php/photo/44/sort/1/cat/506, by Joe Britton
St. Lucie River - catalpa.amberdell.com/st_lucie_river_t.jpg
Waterways of the Everglades – http://media-2.web.britannica.com/eb-media/03/91403-004-DB2FAEAF.jpg

The Economics of the Everglades Watershed and Estuaries

Phase I -- Review of Literature and Data Analysis

Prepared for:
Everglades Foundation

Prepared by:
Center for Urban and Environmental Solutions at Florida Atlantic University

Lenore Alpert, Ph.D. Principal Investigator
William B. Stronge, Ph.D., Senior Fellow and Professor Emeritus, Dept. of Economics, FAU

Consultants:
Phyllis W. Isley, Ph.D. and Jeremy Hill, Georgia Southern University, Bureau of Business Research and Economic Development, Coastal Rivers Water Planning and Policy Center

Research Assistants:
Angela Grooms, Maria Gutierrez, Lauren Schild, Jason Sorensen

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FAU
CENTER FOR URBAN & ENVIRONMENTAL SOLUTIONS
Florida Atlantic University

PREFACE

The Everglades Foundation contracted with the Center for Urban and Environmental Solutions (CUES) at Florida Atlantic University to assess the economic benefits of the Everglades Watershed and estuaries. The economic impact of this ecosystem is being explored in two phases, the first one providing an overview of the ecotourism and recreational benefits of the Everglades Watershed. Review of secondary research on this important watershed covers ecotourism, recreational activities, marine industries, real estate values, and the public value of water supplies, as available in existing studies. A second phase will include primary research on key issue areas where there are research gaps and a need for more in depth information on the Everglades.

Phase I includes an introduction, ecotourism section, literature review, recreational activities, and appendices with an annotated bibliography of key watershed studies, plus a review of recreational activities in each of the 16 counties in the Everglades study area.

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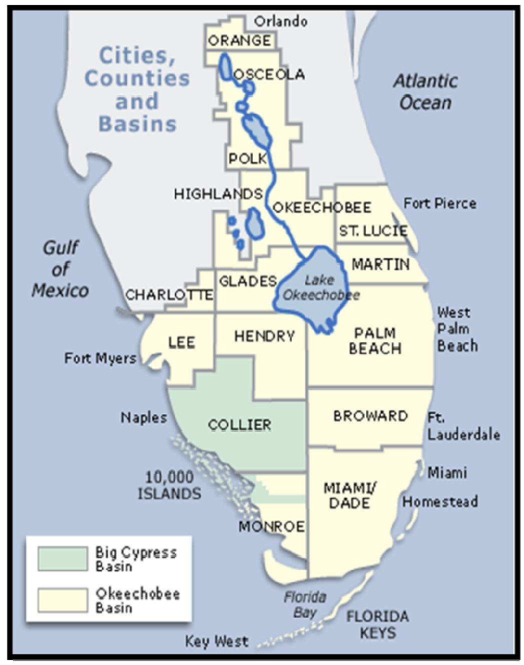
EXECUTIVE SUMMARY

THE EVERGLADES WATERSHED STATE OF THE ECONOMY REPORT

This economic study of the Everglades Watershed is designed to give an overview of the key issues in the Everglades. It is the first phase of an in-depth economic study and is designed to identify areas of concern and their economic value to the state of Florida. There are several sections of the report that assess the economic benefits of the Everglades Watershed, including ecosystem services, ecotourism, and other recreational activities, all of which assume a clean and healthy Everglades Watershed. There is potential for the Watershed economy to be improved by restoration efforts as demonstrated in the findings of a vibrant economy in the Watershed counties and the jobs that it creates. While this study focused on existing research, the next phase will develop primary research to explore further the economic issues of this important natural resource.

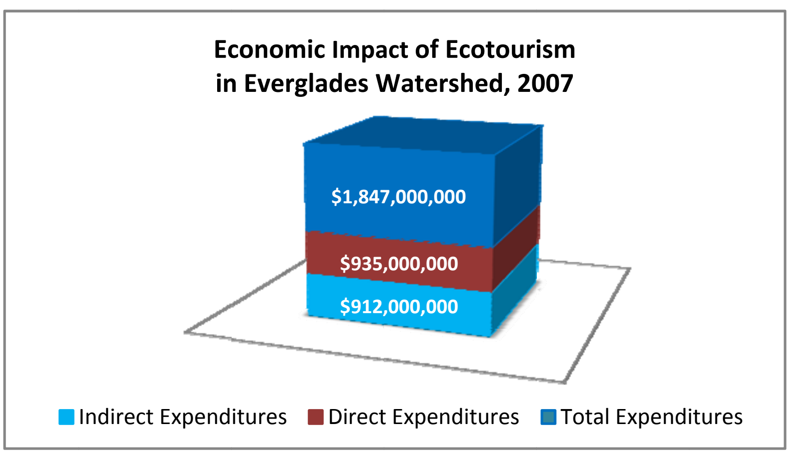


Source: South Florida Water Management District, Geographic Features Maps

<u>**Watershed Economy**</u>

The Everglades Watershed encompasses all or part of 16 counties and includes the Chain of Lakes, Kissimmee River, Lake Okeechobee, the Caloosahatchee and St. Lucie Estuaries, Indian River Lagoon, Biscayne Bay and Florida Bay. The watershed includes about 15.6 million acres—11.9 million acres of land and 3.7 million acres of water.

If the 16-county Everglades Watershed were a state, it would rank ninth in the country in terms of the size of its gross domestic product.



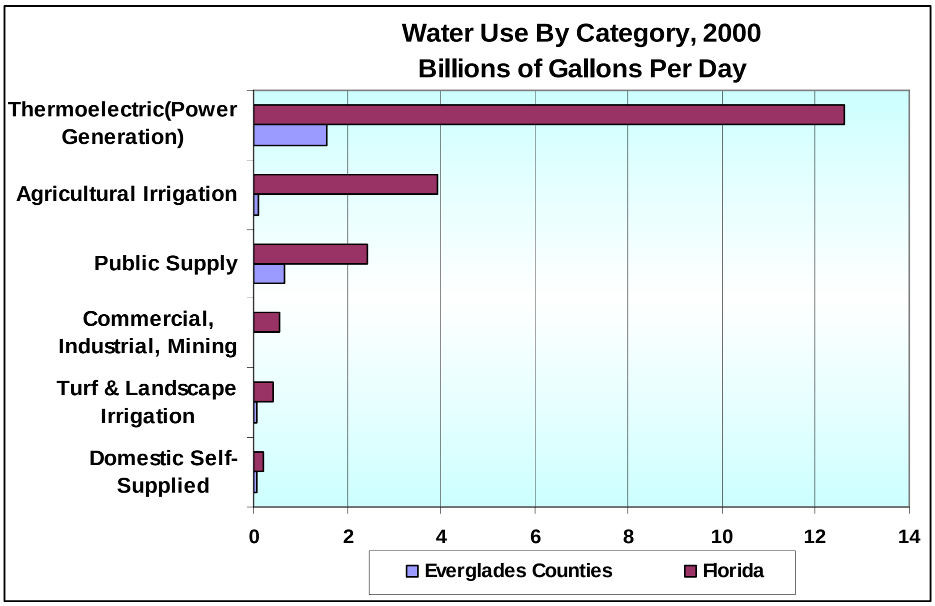
The gross domestic product of the Everglades Watershed amounted to $394.1 billion in 2006. This amounted to 55.5 percent of the gross domestic product of the state.

In an average month in 2008, there were over 3.8 million jobs produced in the Everglades Watershed.[1]

In 2007, direct tourist expenditures connected with Everglades recreation was estimated to be $935 million. Each dollar of direct tourist expenditure yields 97.5 cents of indirect expenditure, or $912 million in 2007.

The Everglades Watershed is a completely rain-driven system. The Watershed must store and sustain the supply of freshwater for approximately 40 percent of the state's population—about 9 million people.

From 2000 to 2025, the total gross water demand for the sixteen-county Everglades Watershed is projected to increase 30%, from 3270.99 to 4242.58 million gallons per day—with some areas projected to increase consumption by 179% in the next sixteen years.



Source: South Florida Water Management District

<u>**Everglades Environmental Value**</u>

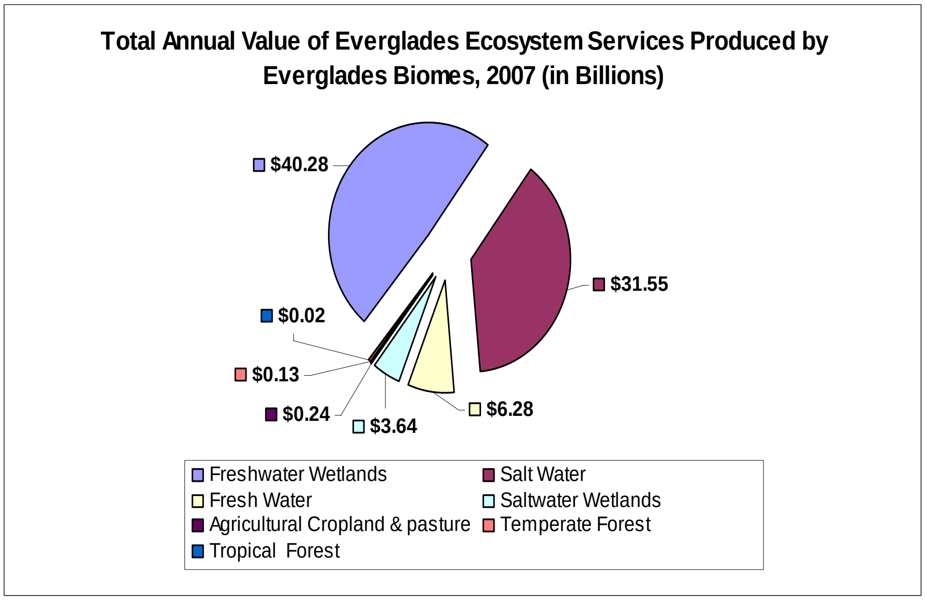
In the Everglades Watershed, vast wetlands and freshwater and saltwater systems provide diverse habitats for a variety of semi-tropical wildlife and plants unique to the world.

The Everglades, like many other ecosystems under natural conditions, produces a myriad of services. These may include slowing water flow to allow sediments and associated pollutants to fall out of the water column (water quality) and to allow water to seep into the aquifer (aquifer recharge). Other ecosystem services include carbon sequestration, climate moderation, flood protection, and nutrient cycling. These services can be enhanced by human manipulation. Some examples of this include Stormwater Treatment Areas through the management of water flow and cultivation of selected wetland plants to remove nutrients from the water column or re-grading eroding shoreline slopes and planting emergent vegetation to provide erosion control.

Within this context, there is an emerging field of Environmental Economics that tries to put a dollar value on the functions that wetlands naturally perform (ecosystem services) and to determine what the dollar loss would be if these wetlands were degraded or destroyed. Conversely, it can also be used to provide an estimate of the increase in value a wetland could perform if it were restored. Although these calculations do not directly compare to the gross domestic production of a region, they are useful in helping to identify the services a natural system provides. **It has been estimated that the ecosystem services provided by the Everglades are worth about $82 billion annually.**

Thinking about the Watershed as a huge supermarket, in this supermarket are "aisles" called "biomes," major regional communities such as wetlands or pinelands that are characterized chiefly by the dominant forms of plant life and the prevailing climate. **These biomes in 13 of the 16 counties within the Everglades Watershed annually create a market for ecosystem "products" and services valued at $82.1 billion.** These ecosystem services include environmental regulation, water supply and treatment, land formation, habitat for wildlife, and ecotourism recreation.

$82.1 BILLION TOTAL ANNUAL ECOSYSTEM SERVICES PRODUCED BY EVERGLADES



Source: Weisskoff (2005). p. 174. Values updated to 2007 $ using Consumer Price Index.

In terms of the value of healthy estuaries, each ecosystem service is assessed a value per acre that varies across biomes. As demonstrated in the adjacent chart, freshwater wetlands (3.3 million acres) have the highest total annual value of ecosystem services because there are more freshwater wetland acres in the Everglades study area. The saltwater biome has the second highest total annual value of ecosystem services due to fewer saltwater acres in this study area. While the Agricultural Cropland & Pasture biome has the greatest amount of acreage in the 13 Everglades counties, it has one of the lowest total annual values of ecosystem services.

Everglades Tourism

In 2007, an estimated 101 million tourists visited the Everglades Watershed where they spent $76.2 billion—an amount almost equal to 20% of the region's GDP. Of the total state and national park visitors in Florida in 2006, 36% visited parks in the Everglades Watershed. An estimated 5.5 million tourists engaged in Everglades recreational activities during their visit to the region in 2007.

On average, these Everglades tourists spent $187.13 daily on lodging, dining, recreation, entertainment, shopping, and local transportation. **If one day of these expenditures is assigned to each reported instance of participating in the Everglades, expenditures connected with Everglades recreation amounts to $935 million.**

Each dollar a tourist spends in Florida results in 97.5 cents of indirect and induced production. This means that the $935 million in direct spending results in an additional $911.6 million in Florida's gross domestic product. **The total number of jobs created by Everglades tourism was 17,799, and labor earnings in the state were increased by $561 million from these jobs.**

Everglades National Park

Visitors to Everglades National Park may utilize Florida Bay, but this does not include the Ten Thousand Islands and other locales accessible only by boat in the 1,509,000 acre park, which are not counted in actual park visitors through the front gates. In 2004, these Everglades National Parks visitors totaled over one million.[2]

Visitors to Everglades National Park generated $39.1 million in total local sales—with a direct effect of $14.7 million in personal income associated with 510 jobs and a secondary effect of $25.5 million in additional value in spending for the Homestead and Florida City area.

These 2004 "recreation visits" to the park were connected to 224,406 "party nights" that complemented the visitor's Everglades experience. Total visitor spending amounted to $27 million, of which $24.2 million was in direct sales. The highest spending was in lodging, while the second highest was in restaurants and bars.

The natural resources within the Everglades Watershed are valuable to the region's economy—somewhere between a conservative value of $5 billion and $24 billion annually.

Estimated Annual Values of Coastal and Estuary Recreation in Florida			
Activity	**Annual Activity Days (millions)**	**Value Estimates (millions $2005)** Low	High
Beach Visitation	**177.153**	**$5/activity day $ 886**	**$50/activity day $ 8,858**
Recreational Fishing	**56.285**	**$60/activity day $ 3,377**	**$100/activity day $ 5,629**
Marine Wildlife Viewing	**77.952**	**$10/activity day $ 780**	**$100/activity day $ 7,795**
Snorkeling	**23.96**	**$10/activity day $ 240**	**$50/activity day $ 1,198**
Scuba Diving	**5.42**	**$15/activity day $ 81**	**$50/activity day $ 271**
Total Potential Economic Use Value		**$ 5,364**	**$ 23,751**

Source: Pendleton, Linwood, ed. (2008). *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Restore America's Estuaries. Table 2. p. 152. Table 4. p.155; Table 6. p.159; Table 8. p. 161; Table 10. p.163; Table 12. p.164; Table 16. p.168.

Statewide, wildlife viewing almost doubled in 2006 from 2001, and total retail sales from 2006 wildlife viewing was estimated at $3.1 billion--$2.4 billion by Florida residents and $653.3 million by tourists.

Value of Healthy Estuaries

Although estuaries and coasts correspond to only 13% of U.S. land, they support 43% of the population, 40% of employment, and 49% of the national output. Estuaries generate 76% of Florida's employment and 78% of Florida's GDP.

Statewide, the ability to enjoy healthy Florida Beaches generates between $886 million and $8.9 billion annually. Recreational Fishing in Florida generates between $3.4 and $5.6 billion annually.

The **Indian River Lagoon** generated $2.96 billion annually in direct expenditures, such as daily recreation, boat, lodging and other costs, and through non-market expenditures, such as restoration, research and education connected with the lagoon. Of the $2.96 billion generated throughout the lagoon area, annual expenditures in Martin and St. Lucie counties generated $723.3 million annually.

Diving, sailing, fishing and other recreational opportunities in **Florida Bay** generated $4.8 billion to Miami-Dade County and $1.1 billion to Monroe County in 2001. Florida Bay supports a $59 million shrimp fishery and a $22 million stone crab fishery.

Biscayne Bay recreational activities contributed $3.8 billion in output (4.4%) to Miami-Dade County's economy in 2004, $2.1 billion in income (3.4%), 57,100 jobs (4.4%), and $257 million (4.3%) in tax revenue. Biscayne Bay's most popular recreational activities in 2004 were viewing (24%), swimming (22%), fishing (19%), and sailing (9%). From 1980 to 2004, the total person-days spent in recreational activities in the Biscayne Bay increased 120% from 30 million to 66 million. Biscayne Bay National Park contributed $19 million in 2004, with visitors annually spending $24 million and supporting 425 local jobs.

The Caloosahatchee Estuary supports a large amount of recreation activities dependent on Everglades restoration. Hunting, fishing, and camping alone are expected to increase at least 40% by 2010.

I. INTRODUCTION

Description of the Everglades Watershed

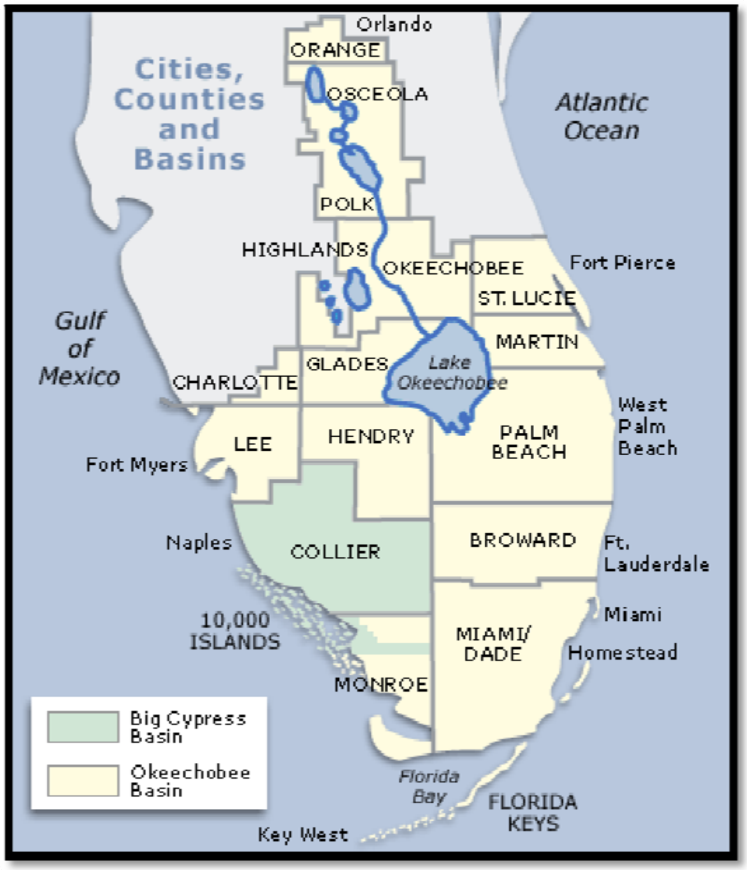
The Everglades Watershed is the region drained by the Everglades River system in the southerly part of the Florida Peninsula. Water moves through the landscape in a generally southern direction and from inland areas to the coasts. The Kissimmee River collects water from its basin at the north end of the watershed and transports it to Lake Okeechobee, the second largest lake wholly within the United States. The lake functions as the headwaters of the Everglades water system to the south. In the early twentieth century, the lake was connected to a number of coastal rivers to the south, including the Hillsboro and Miami Rivers and the New River in Fort Lauderdale, to the Caloosahatchee River that flows west and to the St. Lucie River that flows east to the Indian River Lagoon. These canals were originally constructed to “drain” the Everglades and permit the use of the land for agriculture. Although there is significant agricultural activity in the watershed area, the water system is used for a variety of purposes, including supplying a large population with drinking water, landscape irrigation and supporting the regions’ large economy.

Map 1. Map of South Florida by Geographic Features

Source: South Florida Water Management District, SFWMD Geographic Features Maps

The Everglades Watershed is included in sixteen counties in South Florida, including the southeast coastal counties ranging north from Miami-Dade to St. Lucie Counties; the southwest coastal counties ranging north from Monroe and Collier to Charlotte counties; inland counties including Glades, Highland and Hendry; and four counties north of Lake Okeechobee, including Okeechobee, Polk, Osceola and Orange.[3]

Map 2. The 16 Counties in the Everglades Watershed



Source: South Florida Water Management District, Counties and Basins Overview Maps

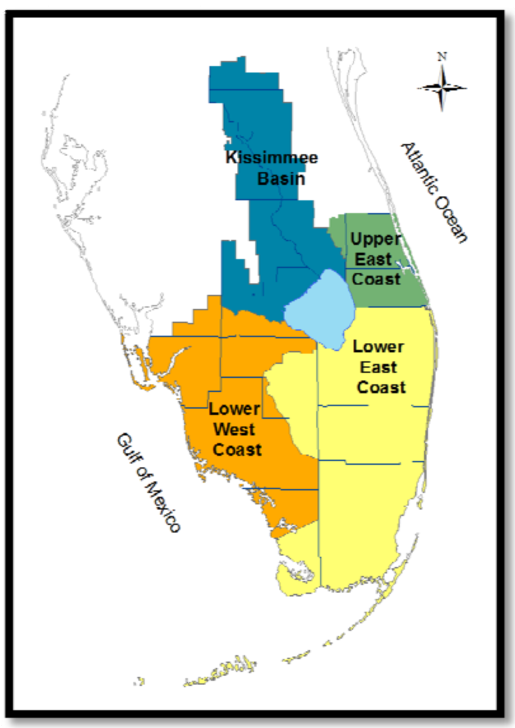
The sixteen counties of the Everglades Watershed region cover a total area of 15.6 million acres, divided between land, 11.9 million acres, and water, 3.7 million acres.[4] The population of the Everglades Watershed Region was 9.0 million in 2007, a little less than 50 percent of the population of the state.[5] The gross domestic product of the sixteen counties amounted to $394.1 billion in 2006. This amounted to 55.5 percent of the gross domestic product of the state. If the Everglades Region were a state, it would have ranked ninth in the country in terms of the size of its gross domestic product.[6] In an average month in 2008, there were over 3.8 million jobs produced in the Everglades Watershed.[7]

It is clear from the foregoing that the economy of the Everglades Watershed is one of the major economies in the nation.

Water Use in the Everglades Watershed

The Everglades Watershed is a major source of water for people living in central and south Florida. As a vast system of wetlands, the Everglades also provide habitat and water for a variety of wildlife and plants. These natural systems help provide the water that supports the large population of nearly half of Floridians. The South Florida Water Management District (SFWMD) includes four Planning Areas: the Lower East Coast (LEC), the Upper East Coast (UEC), the Lower West Coast (LWC), and the Kissimmee Basin (KB).

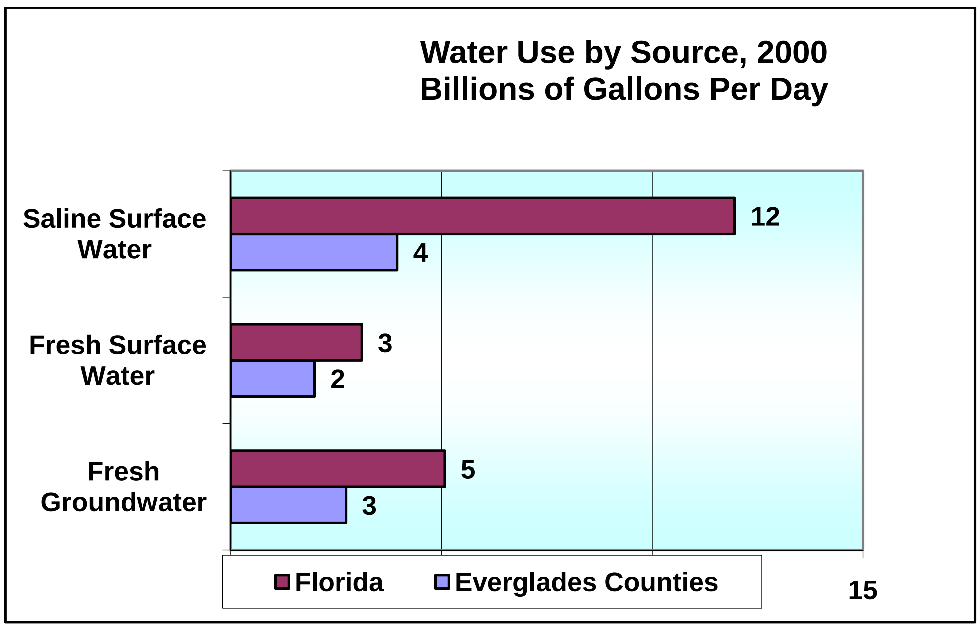
Map 3. Planning Areas in the South Florida Water Management District



Source: South Florida Water Management District

A vital support for this economy in the Everglades is the quantity and quality of water produced in the watershed. In 2000, almost 9 billion gallons of water per day were used in the 16 counties containing the watershed. The water was supplied from three sources: saline and fresh surface water and fresh groundwater.[8] Water use in the Everglades Watershed amounted to 43 percent of total water use in the state. Saline surface water was the largest water source both in the watershed and in the state. Fresh groundwater was the second largest water source in the watershed and the state, and fresh surface water was third.

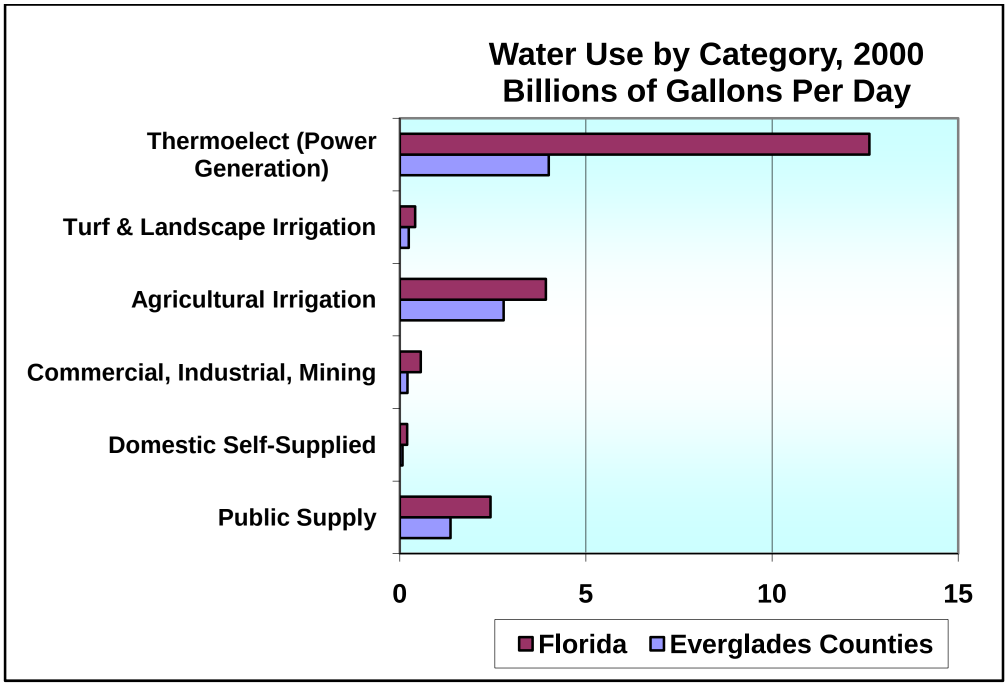
Figure 1.



Source: South Florida Water Management District

Thermoelectric power generation is the largest use of water both in the Everglades Watershed (4 billion gallons per day) and in the state as a whole (more than 12 billion gallons per day).[9] Agricultural irrigation is the second largest use, accounting more than 2 billion gallons per day in the watershed and about 4 billion gallons per day in the state as a whole. The public water supply, as delivered to households and businesses, is the third largest use, accounting for almost 1.5 billion gallons per day in the watershed and almost 2.5 billion gallons per day in the state as a whole.

Figure 2.

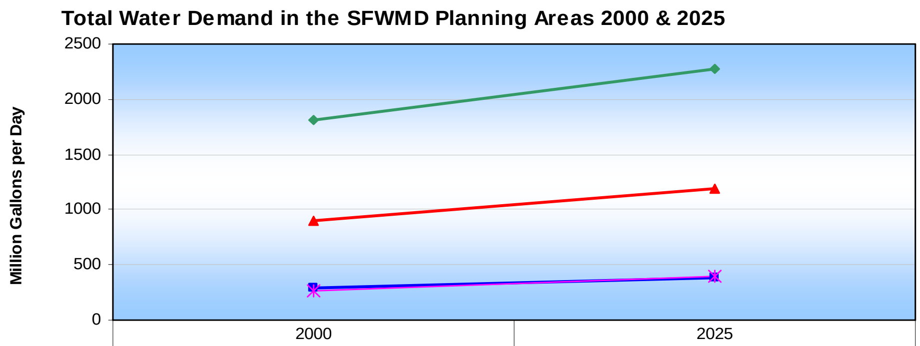


Source: South Florida Water Management District

Projected Water Demands

From 2000 to 2025, the total gross water demand for the SFWMD is projected to increase 30% from 3270.99 million gallons per day (MGD) to 4242.58 MGD. The Kissimmee Basin area, which consumed the least amount of water from the four areas in 2000, is expected to increase consumption by 55% (from 258 MGD to 400.91 MGD) in 2025. The LWC is projected to increase 31%, the UEC by 30% and the LEC, the largest consumer of water in the SFWMD, is projected to increase its consumption by 25%.

Figure 3.



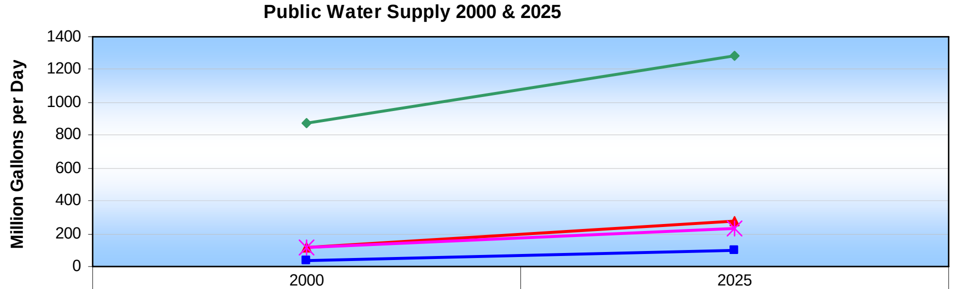
	2000	2025
Lower East Coast	1817.79	2273.17
Upper East Coast	289.8	378.0
Lower West Coast	905.4	1190.5
Kissimmee Basin	258	400.91

Source: South Florida Water Management District. Water Supply Plans.

Total public water supply in 2000 was 1144 MGD, 35% of the total gross water demand, and is expected to increase to 44.7% from the total of 4242.58 MGD in 2025. From 2000 to 2025, the total public supply is projected to increase 66% (from 1144 MGD to 1894 MGD). The UEC public water consumption is expected to increase in 179% from 2000 to 2025. Similar increases are projected for the LWC, 135%, and the Kissimmee Basin, 107%. The LEC, the largest consumer of public water, is projected to increase 66%, from 878.3 MGD to 1286.6 MGD.

Figure 4.

Public Water Supply 2000 & 2025



	2000	2025
Lower East Coast	878.33	1286.56
Upper East Coast	36.5	101.9
Lower West Coast	115.7	272.2
Kissimmee Basin	113.5	235.27

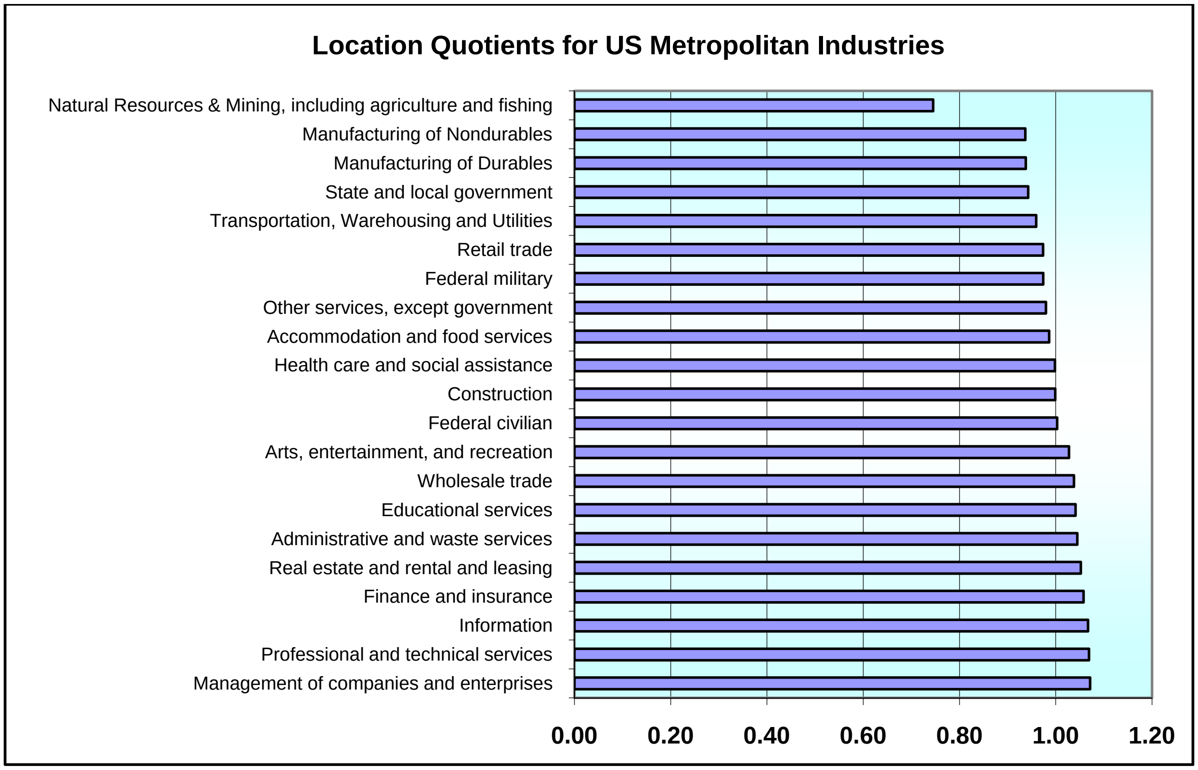
Source: South Florida Water Management District. Water Supply Plans.

The Economy of the Watershed Region

Most of the 16 counties in the Everglades Watershed are in metropolitan statistical areas as defined by the US Census Bureau.[10] The five counties with the smallest populations-- namely Glades, Hendry, Highlands, Monroe and Okeechobee-- are non-metropolitan. Together these account for 2.9 percent of the total population in the watershed. As a result, the economy supported by the watershed can be viewed as a metropolitan in nature.

Nationally, the metropolitan areas of the country had a gross domestic product in 2006 amounting to $11.8 trillion, compared to $1.3 trillion in non-metropolitan areas.[11] The metropolitan areas account for 90 percent of the US economy.

Figure 5.

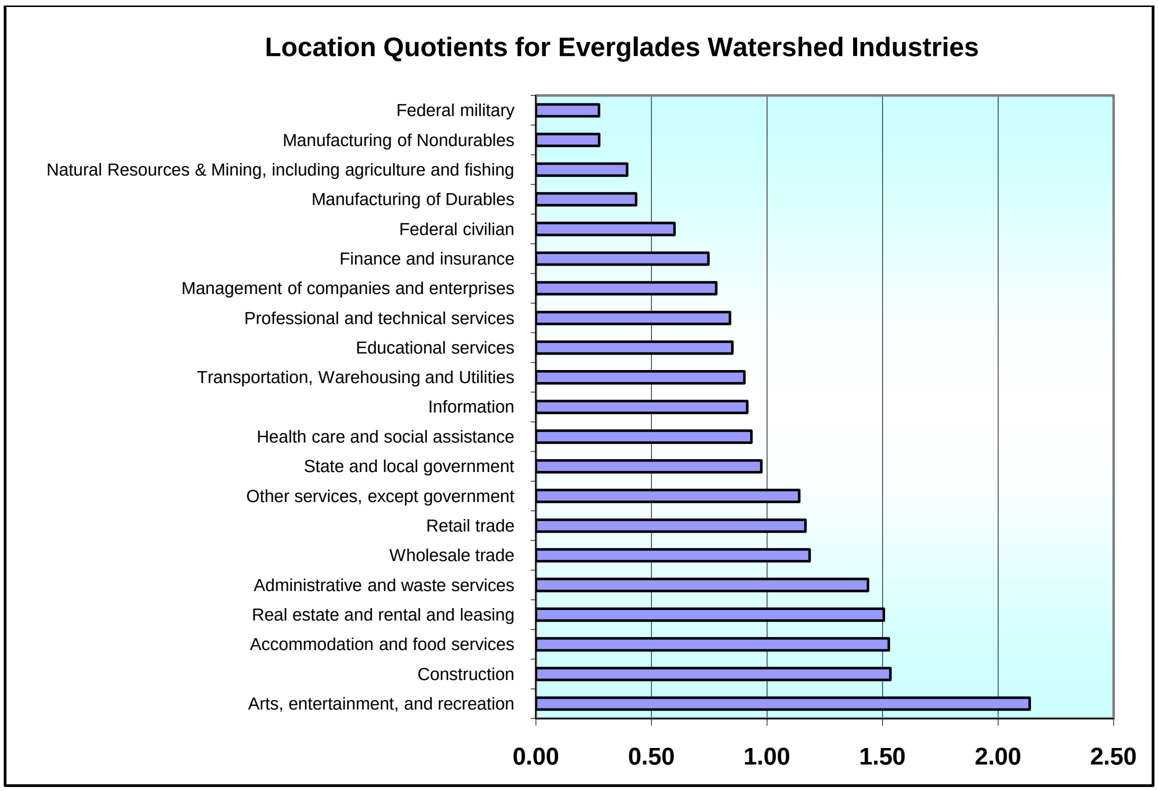


Source: Computed using data from the U.S. Bureau of Economic Analysis website http://www.bea.gov.

By examining the industrial location quotients for the US metropolitan gross domestic product (GDP) relative to the GDP for the country as a whole, the interaction between the metropolitan areas and the non-metropolitan areas can be determined.[12] An industrial local quotient greater than unity indicates that the metropolitan areas of the country export a portion of the industry's production to the non-metropolitan areas of the country. If the location quotient is less than unity, it indicates that the non-metropolitan areas of the country export a portion of the industry's production to the metropolitan areas.

The location quotients in Figure 5 demonstrate the role of the metropolitan areas as services centers. The largest location quotients are for management of companies and enterprises, professional and technical services, information, finance and insurance, real estate and rental and leasing, administrative and waste services, educational services, wholesale trade, arts, entertainment and recreation. The non-metropolitan areas export production of their natural resources industry including agriculture and fishing, their manufacturing industries, state and local government, transportation, warehousing and utilities, retail trade and federal military. Transportation and retail trade is relatively concentrated in non-metropolitan areas because the transportation network is spread out over the country as a whole and because retail outlets are located along the network.

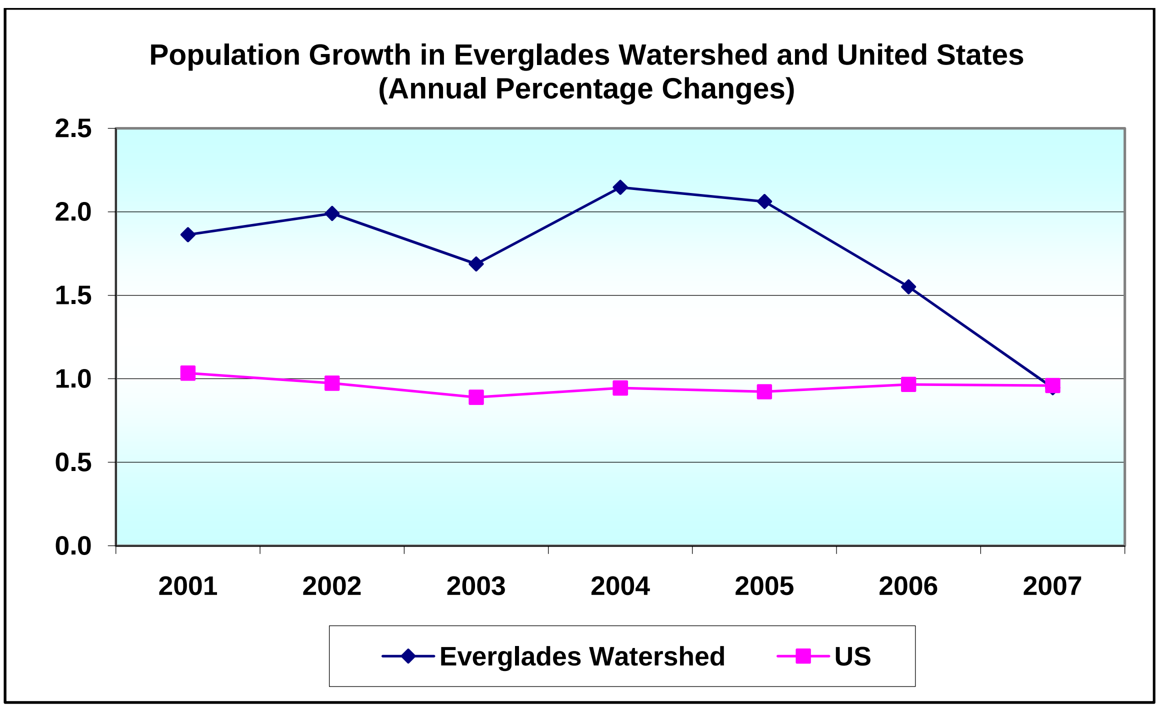
Figure 6.



Source: Computed using data from the U.S. Bureau of Economic Analysis website: http://www.bea.gov. Estimates for nonmetropolitan counties made by CUES.

Location quotients for the Everglades Watershed region relative to the US metropolitan gross domestic product can be used to identify the distinctive features of the watershed economy. The results presented in Figure 6 show the importance of the watershed's historic tourism-retirement industry, as indicated by the large location quotients for arts, entertainment and recreation, accommodation and food services, retail and wholesale trade.[13] Retirees are grouped together with tourists because they have similar spending patterns reflecting the relatively part of their time they are engaged in leisure activities, such as recreation and entertainment, eating out at restaurants and shopping. The primary difference in spending patterns between the two groups is that tourists are more likely to stay in hotels and other short term commercial lodging places, and retirees are more likely to own their own place of lodging.

Figure 7.



Source: Computed using data from the U.S. Bureau of the Census website: http://www.census.gov.

A second important exporting industry consists of construction and real estate. These industries reflect the relatively rapid population growth of the region's population. For most of the years since 2000, annual population growth in the watershed region was about two percent, compared to a one percent annual average rate of population growth in the nation as a whole. The construction and real estate industries expanded in order to provide housing for this growth and to accommodate expansions in industries impacted by the growth. In the years 2004 and 2005, additional expansion of housing units occurred as speculators entered the market. In 2006, this speculative bubble ended, and population growth declined. By 2007, population growth in the region had declined to the national rate, a situation very unusual by historical standards.[14]

Table 1. Regions of the South Florida Water Management District

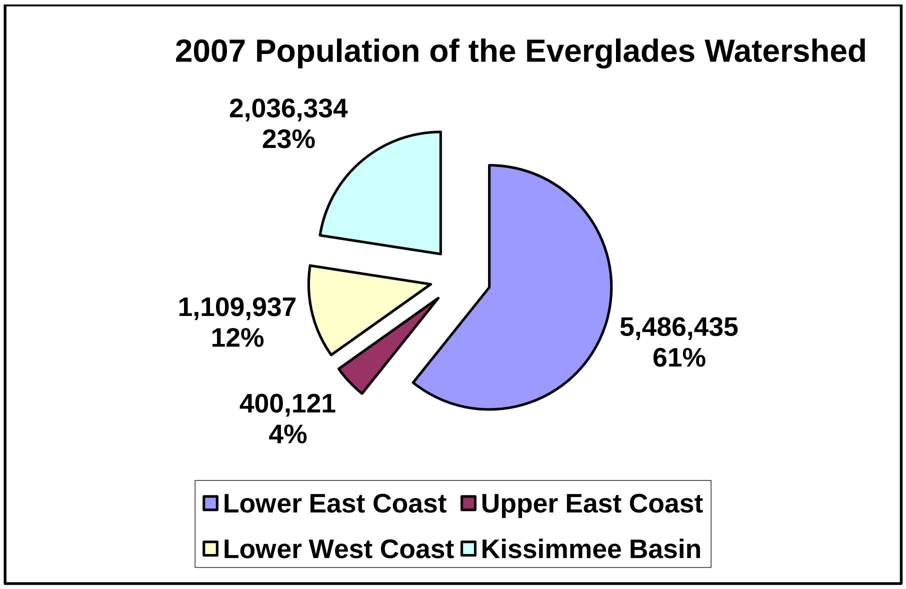
Region	Counties
Lower East Coast	**Monroe, Miami-Dade, Broward, Palm Beach**
Upper East Coast	**Martin, St. Lucie**
Lower West Coast	**Collier, Lee, Hendry, Glades, Charlotte**
Kissimmee River Basin	**Charlotte, Okeechobee, Highlands, Polk, Osceola, Orange**

Source: South Florida Water Management District

Population in the Everglades Watershed

In order to understand the nature of the population growth in the watershed area, it is helpful to divide it into regions following the approach taken by Weisskoff (2005, p.21)[15]. The watershed is divided into four regions as shown in TABLE 1 and Map 3 above.

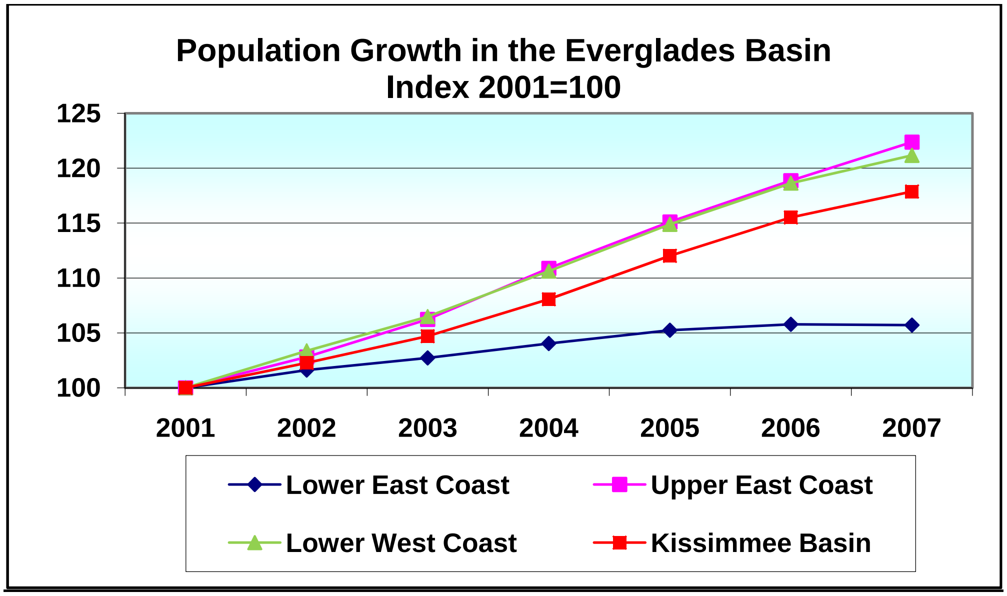
Figure 8.



Source: Computed using data from the U.S. Bureau of Census website: http://www.census.gov.

Over 60 percent of the population in the watershed counties is in the Lower East Coast and almost one in four persons live in the Kissimmee Basin. The Upper East Coast and Lower West Coast regions have relatively small populations.

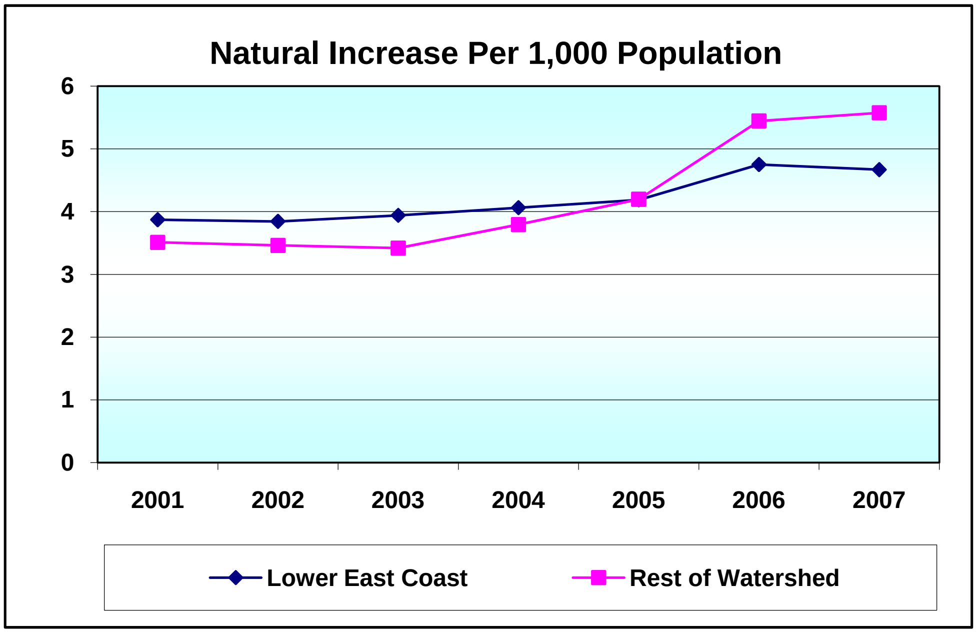
Figure 9.



Source: Computed using data from the U.S. Bureau of the Census website: http://www.census.gov

Population growth in all the regions of the Everglades Watershed has been greater than two percent per annum, except in the Lower East Coast, the most populous part of the watershed.

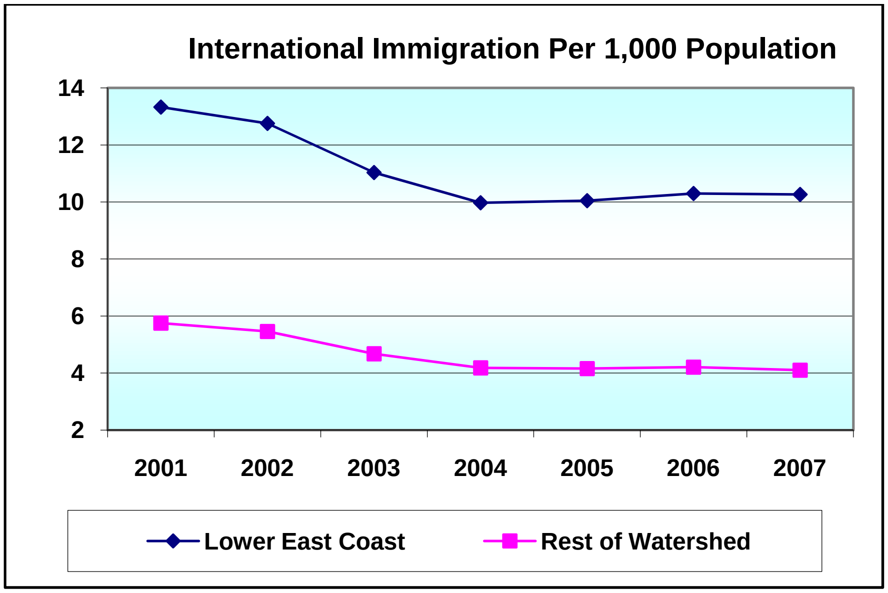
Figure 10.



Source: Computed using data from the U.S. Bureau of the Census website: http://www.census.gov

The Census Bureau distinguished among three sources of population change: natural increase (excess of births over deaths), international immigration, and net domestic in-migration (excess of in-coming migrants from elsewhere in the United States over the outflow of local residents to other parts of the country). The rate of natural increase is relatively small in the Everglades Watershed, and the two rates are similar in both parts of the watershed.

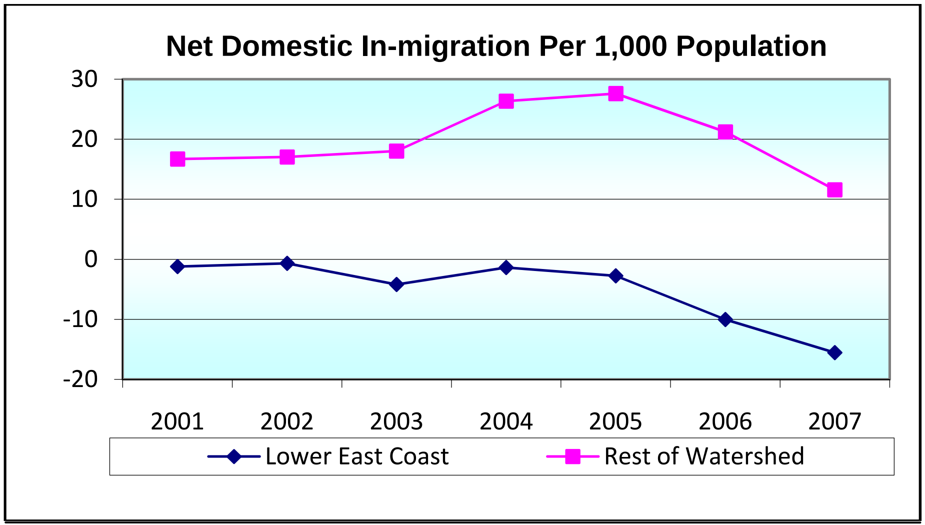
Figure 11.



Source: Computed using data from the U.S. Bureau of the Census website: http://www.census.gov

International immigration has been the largest source of population growth in the Lower East Coast Region since the new century began. The rate of international immigration is much higher in this region than in the rest of the watershed. The rates have declined throughout the region since the new century began.

Figure 12.



Source: Computed using data from the U.S. Bureau of the Census website: http://www.census.gov

Net domestic in-migration is the largest source of population growth in the watershed outside the Lower East Coast. Although people of all ages migrate into the watershed area, the leading group traditionally has been retirees who bring financial resources to the region and create jobs for younger in-migrants. Domestic in-migration outside the Lower East Coast was at high levels until 2006 when it began to taper off. Net domestic immigration to the Lower East Coast has been negative in the new century; that is, more local residents moved from the watershed area to the rest of the country than came to watershed from elsewhere in the United States. The chart shows, moreover, that the net outflow increased from the Lower East Coast in 2006 and 2007, the same years when the net inflow into the rest of the watershed slowed.

One explanation advanced for the slowdown in net domestic net in-migration to the watershed is the active and serious hurricane season of 2004 and 2005, which resulted in concerns for personal safety, interruptions of electric power, severe property damage and sharp increases in home insurance rates. Another factor is the sharp increase in property values that occurred during the housing bubble that ended in 2006. Finally, as the population growth ended, there was a sharp decline in construction and real estate jobs, leading some workers to relocate to other parts of the country and deterring the inflow of such workers from elsewhere.

It is likely that the construction and real estate industry will experience some recovery in the years ahead as the large Baby Boom generation retires, especially if the watershed is not impacted by hurricanes for a number of years. Additionally, the phenomenon of chain migration and the appeal of the bilingual population are likely to continue to attract international immigrants.

II. ECOSYSTEM SERVICES

The Value of Ecosystem Services

The Everglades Watershed contains multiple ecosystems, communities "of animals and plants interacting with one another and with their physical environment. Ecosystems include physical and chemical components, such as soils, water, and nutrients that support the organisms living within them".[16] As will be noted below, the Everglades include wetlands, tropical forests and open water (rivers and lakes). Ecosystems produce *ecosystem services* which result in clean water, waste treatment, soil formation, species diversity, food production, and recreation. These services play an important role in supporting human populations and local economies.

The Everglades Watershed obtains its water primarily from rain that falls in the region. Some water may also be obtained by the movement of water underground from outside the region. Water flows through the watershed from north to south and from the interior to the coast. The watershed provides ecosystem services that contribute to the health of the economy and the well-being of the population. Although most of these services are not bought and sold on markets, they have economic value. We know this because in cases where the watershed doesn't provide a sufficient level of service, governments and enterprises supplement the services. This supplementary activity costs money and usually results in charges to the beneficiaries of the services.

The rainfall that falls on the watershed is seasonal in nature, with large amounts falling in the summer months and smaller amounts falling in the winter months. One of the services provided by the watershed is the storage of summer water for use during the winter. Indeed, the storage of water in years when rainfall is high is needed for use in years when rainfall is low. Large amounts of expenditures have been undertaken by governments and enterprises in the region to store water over and above the water storage that occurs "naturally" in the watershed. These expenditures imply an implicit cost per gallon stored per day, and these costs are borne by governments or by the customers of privately constructed facilities.

As rain falls on undeveloped areas in the watershed, it sinks through the ground and the resulting filtration cleans the water to make it more usable by the local population and economy. In some parts of the watershed, stormwater treatment areas have been constructed to improve the natural filtration of rainfall. Costs of the construction of these areas once again imply implicit values for the "natural" water treatment service provided by the watershed. Additionally, stormwater treatment plants have been constructed, largely with public funds, to clean water to the quality necessary for public consumption or for discharge into the ocean. The costs incurred in constructing and operating these water treatment plants again imply a value for the ecosystem service undertaken naturally by the watershed.

As water moves through the watershed, the deposit of organic matter builds up soil that can be used for agriculture and landscaping. Such soil can be purchased in the market place showing that the service of soil production in the watershed has an economic value. More generally, the soil in the watershed has historically supported one of the largest agricultural industries in the nation. Although the industry produces traditional food products, including livestock products, vegetables and sugar, there is also significant large production of sod and nursery plants that contribute to the beauty of the urban landscape in the watershed.

The wetlands and water storage areas in the watershed provide a habitat for diverse wildlife, including birds and fish. South Florida has long had tourist attractions where people willingly paid admission charges in order to view exotic birds, fish and other animals. Additionally, tourists in the region have long taken trips into the natural areas in the watershed to view birds and alligators. These ecotourists have willingly paid the costs of undertaking these trips, once again showing that the watershed provides services that have economic value.

The ecosystem services listed above do not exhaust all the services that scientists have identified as being provided by the watershed. They have been discussed in order to explain to the reader that such services have economic value, even though many are not traded in markets, and are a vital part of the economy in the watershed.

This section of the report presents two studies that have calculated the value of the ecosystem services produced by the Everglades Watershed. The first presents a study by Weisskoff (2005), which provided a "macro" view of the services produced in thirteen[17] of the sixteen counties in the watershed. The second study by Casey et al. (2008) is a "micro" study that estimated the value of the ecosystem services produced by the water management areas in the watershed. Both studies used the results of GIS research to estimate the acreages of the landforms or biomes in their study areas. Per acre values of the annual ecosystem services produced by the different landforms were obtained from a comprehensive global review of literature undertaken by Costanza et al. (1997), which were applied to the landform acreages to estimate the value of the ecosystem services produced in the study areas (see Table 2).

Table 2. Ecosystem Services

Ecosystem Goods and Services	Functions and Examples
1. Gas Regulation	CO_2/O_2 balance, O_2, SO_4 levels
2. Climate Regulation	Temperature, precipitation, greenhouse gases,
	DMS for cloud formation
3. Disturbance Regulation	Storm protection, flood control, drought recovery
4. Water Regulation	For agriculture (irrigation), industry (cooling power generators)
5. Water Supply	Storage, retention by watersheds, reservoirs, aquifers
6. Erosion Control Sediment Retention	From wind, runoff, store silt in wetlands
7. Soil Formation	Rock weathering, accumulation of organic material
8. Nutrient Cycling	Nitrogen fixation, N, P, and other cycles
9. Waste Treatment	Nutrient breakdown, pollution control, detoxification
10. Pollination	For reproduction of plant populations
11. Biological Control	Regulate animal population; keystone predator control
	of prey species (Florida panther, alligator)
12. Refugia	For resident and transient populations: nurseries, migratory birds, orchid species
13. Food Production	Extractable portion from gross primary production: fish, game, nuts, subsistence farming; Indian tribal activity
14. Raw Materials	Extractable portion: lumber, fuel, fodder, peat
15. Genetic resources	Medicines, genes resistant to plant and crop pests,
	Ornamental species
16. Recreation	Ecotourism: sport fishing, camping, boating, outdoor activities
17. Cultural	Non-commercial: aesthetic, artistic, educational, spiritual, scientific values

Source: Costanza et al. (1997). Table 1, reproduced in Weisskoff (2005), p. 164.

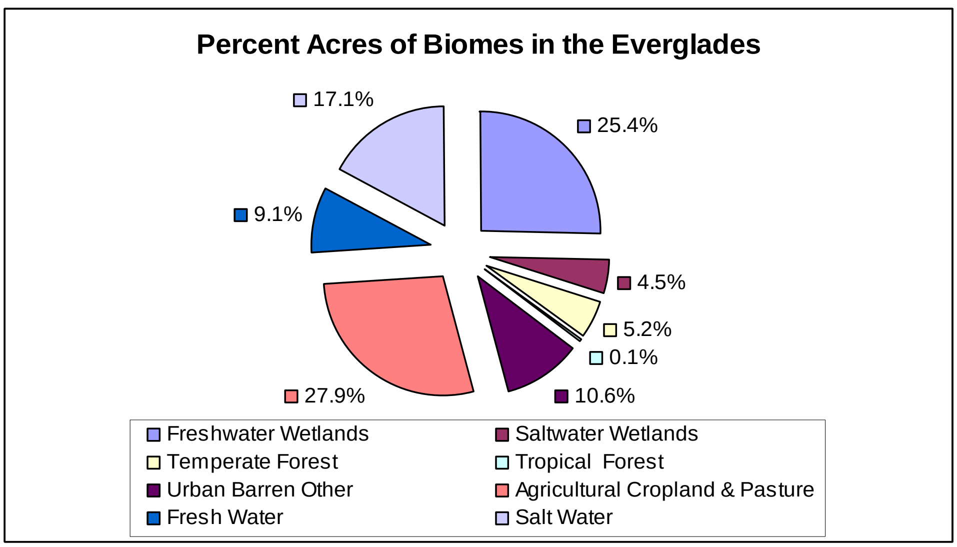
Using a GIS survey of land use/land cover for 1995 conducted for the South Florida Water Management District, Weisskoff (2005) identified eight biomes (groups of ecosystems) in the Everglades area. The biomes and their acreages are given in Table 3.

Table 3. Areas of Biomes in the Everglades (Thousands of Acres)

Biome	Area
Agricultural Cropland & Pasture	3,664
Freshwater Wetlands	3,339
Salt Water	2,243
Urban Barren Other	1,398
Fresh Water	1,200
Temperate Forest	680
Saltwater Wetlands	591
Tropical Forest	14
Total	**13,129**

Source: Weisskoff (2005). p.174.

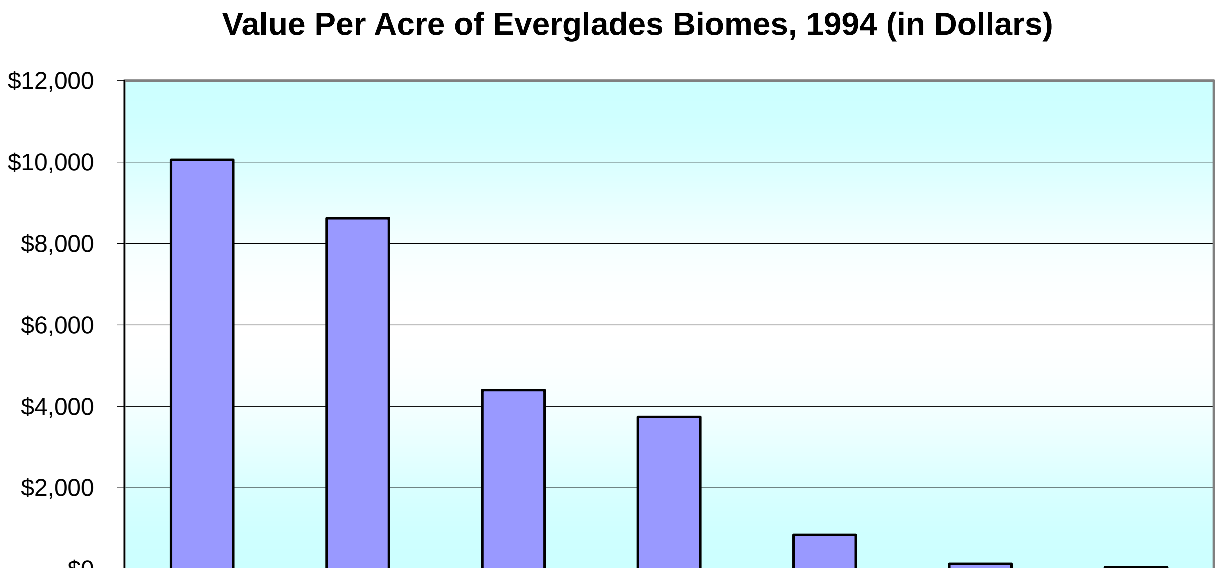
Figure 13.



Source: Weisskoff (2005).

Costanza (1997) provided a basis for identifying the different ecosystem services produced by each biome and their per acre values. Weisskoff's results are reproduced in Figure 14.

Figure 14.



	Salt Water	Fresh Water Wetlands	Salt Water Wetlands	Fresh Water	Tropical Forest	Temperate Forest	Agricult.Crop-land & Pasture
Value Per Acre	$10,054	$8,621	$4,399	$3,742	$843	$133	$47

Source: Weisskoff (2005).

Table 4. Everglades Biomes, Their Ecosystem Services, and Value Per Acre (1994 Dollars)

Ecosystem Service	Fresh Water Wet-lands	Salt Water Wet-lands	Tem-perate Forest	Tro-pical Forest	Urban Barren Other	Agricult.Crop-land & Pasture	Fresh Water	Salt Water
Gas Regulation	$117							
Climate Regulation			$39	$97				
Disturbance Regulation	$3,188			$2				$250
Water Regulation	$13	$810		$3			$2,398	
Water Supply	$3,346			$3			$932	
Erosion Control				$102				
Soil Formation			$4	$4				
Nutrient Cycling				$386				$ 9,291
Waste Treatment	$730	$2,949	$38	$36			$293	
Pollination						$7		
Biological Control			$2			$12		$34
Refugia	$193	$74						$58
Food Production	$21	$205	$22	$13		$28	$18	$229
Raw Materials	$22	$71	$11	$132				$11
Genetic Resources				$17				
Recreation	$216	$290	$16	$47			$101	$168
Cultural	$775		$1	$1				$13
Total	**$8,621**	**$4,399**	**$133**	**$843**		**$47**	**$3,742**	**$10,054**

Source: Weisskoff (2005).

The values per acre in Table 4 represent the annual values of the production of the goods or services produced in the biome. As can be seen from the table, the saltwater biome had the highest value per acre ($10,054), due to a high value of nutrient recycling; freshwater wetlands had the second highest value per acre because of high values for disturbance regulation and water supply. Saltwater wetlands also had a high value per acre because of waste treatment services, and the fresh water biome also had a relatively high value because of water regulation.

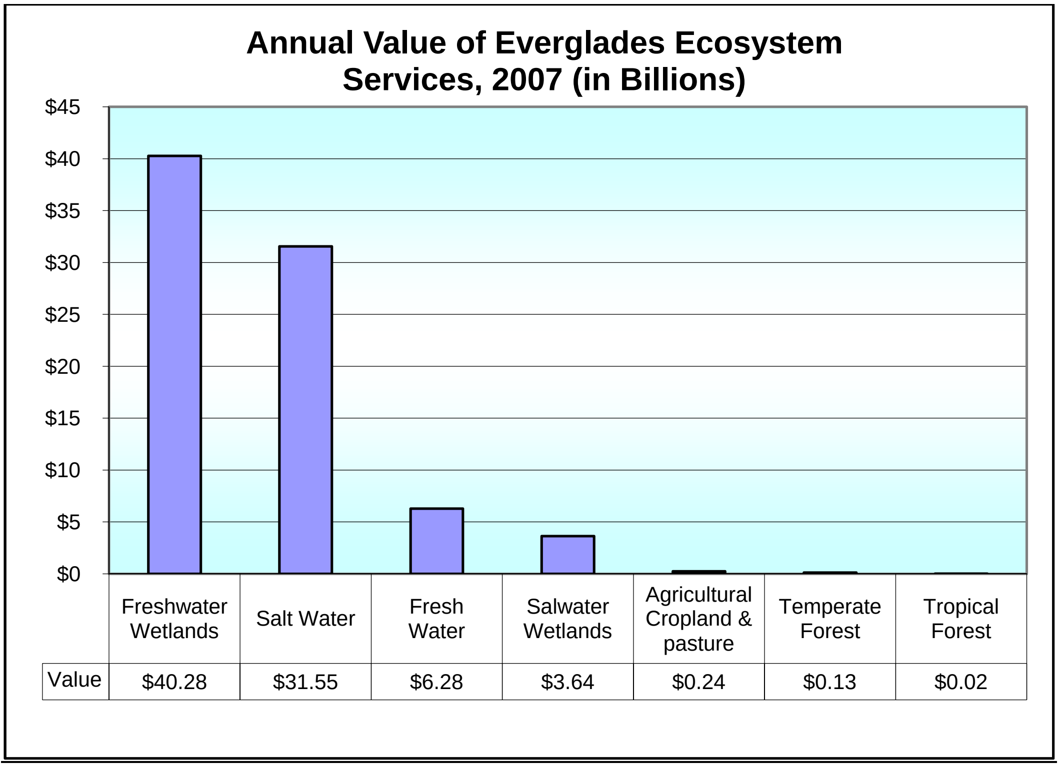
Weisskoff multiplied the values per acre by the total acreage for each of the eight biomes to estimate the annual value of ecosystem services produced in the Everglades area. He used the consumer price index to update the values to year 2000 dollars. Table 5 contains his results, updated to year 2007 dollars by CUES, using the consumer price index, the All Urban Consumers Consumer Price Index Series CUUR0000SA0.[18]

Table 5. Total Annual Value of Everglades Ecosystem Services (Billions of 2007 Dollars)

Biome	'000 Acres	Unit Value 2007 Dollars	$ Billions
Freshwater Wetlands	3,339	$12,063	$40.278
Salt Water	2,243	$14,067	$31.551
Fresh Water	1,200	$5,235	$6.283
Saltwater Wetlands	591	$6,155	$3.637
Agricultural Cropland & pasture	3,664	$66	$0.241
Temperate Forest	680	$186	$0.127
Tropical Forest	14	$1,181	$0.017
Urban Barren Other	1,398	$0	$0.000
Total	**13,129**	**$38,952**	**$82.134**

Source: Weisskoff (2005). p. 174. Values updated to 2007 $ using Consumer Price Index.

Figure 15.



Source: Weisskoff (2005). p. 174. Values updated to 2007 $ using Consumer Price Index.

The biomes in the 13 Everglades counties annually produce ecosystem services valued at $82.1 billion. These same counties produced a gross domestic product of $309 billion in 2006, so that the value of the Everglades ecosystem services were more than one fourth of the output of the region.[19]

A study with a narrower focus was conducted by Casey et al. (2008) They used the Costanza et al. (1997) methodology and applied it to ten land conservation areas in Florida. The authors applied the methodology to the conservation areas in the Everglades but did not publish the results in their report. In a personal communication, Casey noted, "In the report, we left out the information on benefits we had estimated for the Everglades because we were only looking at the benefits associated with state conservation lands, and the Everglades has a lot of Federal lands that make up the system."

Casey et al. obtained estimates of the size of the conservation areas from their management plans as prepared by either the Florida Fish and Wildlife Conservation Commission, the Florida Department of Environmental Protection, or the Florida Division of Recreation and Parks.[20] They used the ecosystem information for the conservation areas available from Florida Fish and Wildlife Conservation Commission, Florida Vegetation and Land Cover (2003), Boundary Information, FNAI (2007).

The information developed for the conservation areas in the Everglades is reproduced in Table 6.

Table 6. Ecosystem Types and Acreages in Everglades Conservation Areas

Ecosystem Type	Acres
Freshwater Marsh/Wet Prairie	403,824
Swale	234,148
Cattail Marsh	52,836
Hydric Hammock	20,487
Ruderal/Disturbed Land	13,500
Open Water	3,682
Developed	1,503
Exotics	82
Total Everglades Conservation Areas	**730,062**

Source: Casey et al. (2008). and personal communication, 2008.

Casey developed a crosswalk to enable these ecosystem acreages to be assigned to the ecosystem types used by Costanza et al. 1997. The crosswalk is given as Table 7.

Table 7. Correspondence of Costanza and Fnai Ecosystem Classifications

Costanza et al. Ecosystem Classification	FNAI Equivalent Ecosystem Category
Coastal	Beach dune
Estuaries	Estuarine unconsolidated substrate
Tropical Forest	Maritime/ tropical hammock
Temperate/Boreal Forest	Exotics, hardwood hammock, mesic flatwoods, mesic hammock, pinelands, pine plantation, prairie hammock, sandhill, scrub, scrubby flatwoods, seepage slope, upland hardwood forest, upland mixed forest, xeric hammock
Grass/Rangelands	Dry prairie, ruderal/ disturbed land, shrub and bushland
Tidal Marsh/Mangroves	Basin marsh/ depression marsh, cattail marsh, estuarine tidal marsh/ coastal saltmarsh, floodplain marsh, freshwater marsh/wet prairie, swale
Swamp/Floodplains	Basin swamp, baygall, bay swamp, bottomland forest, cypress swamp, dome swamp, floodplain forest, floodplain swamp, hardwood swamp, hydric hammock, mangrove swamp, shrub swamp, slough, strand swamp, wet flatwoods
Lakes/Rivers	Blackwater stream, coastal dune lake, open water, spring-run stream
Cropland	Grasslands and agriculture.

Source: Casey et al. (2008). p.22.

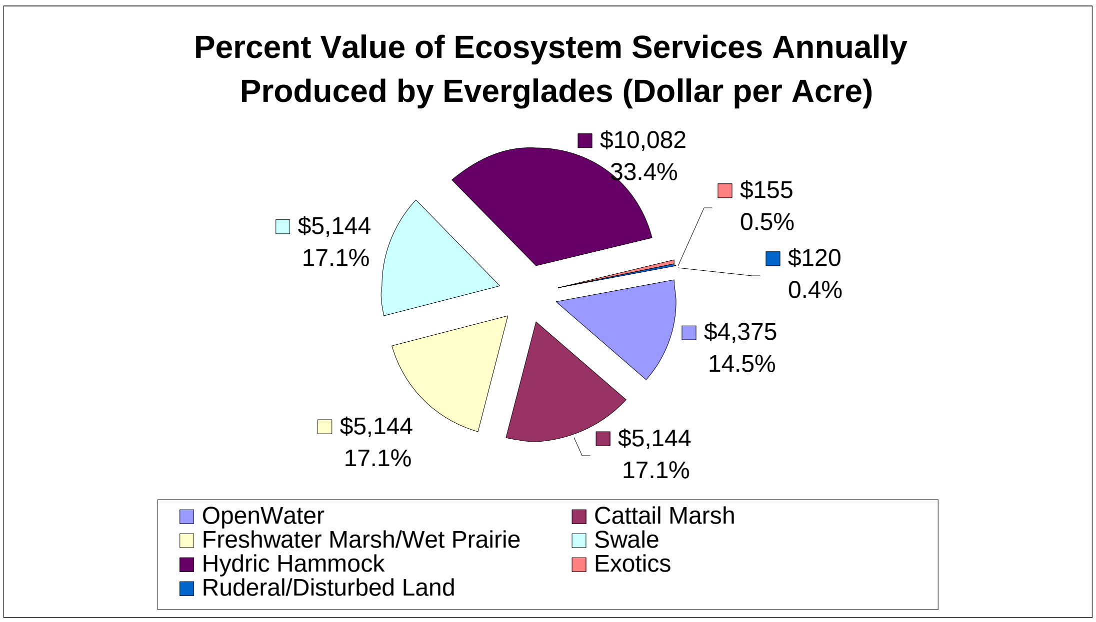
Using the crosswalk and the values per acre provided by Costanza, the value of the annual production of ecosystem services of the conservation areas in the Everglades can be estimated, and the results are given in Table 8 and Figure 16. The values per acre have been updated using the consumer price index.[21]

Table 8. Value of Ecosystem Services Annually Produced by Everglades Conservation Areas

Ecosystem Type	Acres	Value/Acre	Value
Freshwater Marsh/Wet Prairie	403,824	$5,144	$2,077,270,656
Swale	234,148	$5,144	$1,204,457,312
Cattail Marsh	52,836	$5,144	$271,788,384
Hydric Hammock	20,487	$10,082	$206,549,934
Open Water	3,682	$4,375	$16,108,750
Ruderal/Disturbed Land	13,500	$120	$1,620,000
Exotics	82	$155	$12,757
Developed	1,503	$0	$0
Total Everglades Conservation Areas	**730,062**	**$30,164**	**$3,777,807,793**

Source: Casey et al. (2008).

Figure 16.



Source: Casey et al. (2008).

The conservation areas of the Everglades annually produce ecosystem services valued at $3.78 billion. The largest part of the $3.78 billion total comes from the Freshwater/Wet Prairie ($2.1 billion) and Swale ($1.2 billion) ecosystem types.

III. ECOTOURISM IN THE EVERGLADES WATERSHED

Large parts of the watershed are used to store water for use when rainfall is low, and to remove water from the region after periods of excessive rainfall. These storage areas provide habitats for birds, animals, and fish, which in turn provide recreational opportunities for the resident population and the large number of tourists who visit the region each year. In 2007, an estimated 101.0 million tourists visited these counties where they spent $76.2 billion, an amount almost equal to 20 percent of the gross domestic product of the region.[22] Tourism is clearly a leading sector in the economy supported by the Everglades Watershed.

Visitors to the region were asked whether they enjoyed the types of recreational opportunities provided by water bodies in the watershed. Typically, they were asked to select from a list of activities they might have engaged in, and the extent to which they indicated that they enjoyed a recreational activity associated with the Everglades was used as a basis to estimate the proportion of tourists who enjoyed Everglades recreational activities. A conservative estimate of the percent of visitors engaged in Everglades recreational activities is 5.5 percent of the total.[23] The estimate is conservative because it ignores activities such as boating and fishing which may have had an Everglades component. These activities were not included since respondents to the survey could select more than one activity in answer to the question, and their inclusion would have led to some amount of double counting. An additional reason for labeling the estimate conservative is that it was assumed because of lack of data that tourists, on average, engaged in an Everglades activity on only one occasion during their stay in the region.

An estimated 5.5 million tourists engaged in Everglades recreational activities during their visit to the region in 2007. These tourists had an average per person daily expenditure of $187.13, including lodging, dining, recreation entertainment, shopping and local transportation. Assigning one day of expenditures to each reported instance of participation in Everglades recreation results in a total estimate of expenditures connected with Everglades recreation, amounting to $935 million.

The direct expenditures by tourists take place in "front line" industries, such as hotels, restaurants, retail stores and the like. The increase in production (sales), jobs and (labor) earnings in these industries stimulate increased production, jobs and earnings in the industries that supply the front line industries and, in turn, increased production, jobs and earnings in the industries that supply the suppliers -- known as the indirect effects of tourist expenditures. Additionally, as the earnings of workers in the front line and supplying industries increase, they will increase their spending and this will result in increased production, jobs and earnings in those industries that meet the living needs of workers in the region, including those supplying housing, groceries, gasoline and other consumer goods and services. These are referred to as the induced effects of tourist spending.

A special run of the RIMSII Model produced by the Bureau of Economic Analysis of the US Department of Commerce shows that each dollar of tourist expenditure in Florida results in 97.5 cents of indirect and induced production, so that the $935 million in direct spending results in an additional $911.6 million in the gross domestic product of the state of Florida.[24] The total number of jobs created by Everglades tourism was 17,799 and (labor) earnings in the state were increased by $561.0 million.

IV. OTHER RELEVANT STUDIES

The Economic Impact and Value of Coasts and Estuaries

The significance of coasts and estuaries goes far beyond the economic impact they generate. Apart from the economic impact of coasts and estuaries, the economic value adds the importance of non-market value or the willingness to pay to use or protect coastal recreational resources. Yet, the non-market value of estuaries and coasts is dependent on the ecologically healthy conditions, which increases the willingness to pay to use or protect these resources[25].

Although estuaries and coasts correspond to only 13% of the U.S. land, they support 43% of the population, 40% of employment and 49% of the national output. In Florida, 13 million people live in estuary regions, corresponding to 77% of Florida's population.[26] Additionally, 76% of Florida's employment and 78% of Florida's GDP is generated in the estuary regions (see Table 1).[27]

Table 9. Proportion of Florida's Estuary Regions in the State's Economy

Florida	
Population in Estuary Regions	13,328,406
% of State Population	**77%**
Employment in Estuary Regions	5,432,923
% of state employment	**76%**
GDP in Estuary Region (millions)	$474,240
% of state GDP	**78%**

Source: Pendleton, Linwood, ed. (2008). *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Restore America's Estuaries. Table 5. p.45.

Map 4. Estuary Regions in Florida

Source: Pendleton, Linwood, ed. (2008). *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Restore America's Estuaries. Figure 1. p.38.

In order to understand and quantify the economic value in coasts and estuaries it is necessary to look at the economic value of recreation. Recreational activity is measured in activity days where an activity day is "equal to one person doing an activity or visiting any setting for part of a day"[28]. State and national data on user activity is compiled by the National Survey on Recreation and Environment (NSRE). Values for each activity are taken from different literature.

In Florida, values for beach recreation range from $2.46 per activity day (Bell and Leeworthy, 1986) to $120.74 per activity day (Leeworthy and Bowker, 1997).[29] Lows and highs estimate values were set at $5 and $50 per activity day in Pendleton's analysis (see Table 10 for all activities). Results show that the value of Florida's beach recreation is estimated between $886 million to $8.9 billion annually. Similarly, estimated annual economic value of recreational fishing in Florida falls between $3.4 billion to $5.6 billion. Regarding marine wildlife watching (includes bird and whale watching), people dedicate 78 million days to this activity spending around $780 million to $7.8 billion. Combining scuba diving and snorkeling, people spend between $321 million to 1.5 billion annually (See Table 10).

Therefore, Florida's estimated use value of coastal and estuary recreation (for beach visitation, marine wildlife viewing, recreational fishing, snorkeling, and scuba diving) lies between a conservative value of $5 billion and $24 billion annually. Comparing the lowest value, $5 billion, with the value for the GDP generated by all ocean sectors in Florida in 2004, $15.4 billion[30], one can infer that the values of coastal and estuary recreation are very high. Unfortunately, data provided for activity days is aggregated for both of Florida's coasts, not broken down by county or region, so further analysis is not possible.

Table 10. Estimated Annual Values of Coastal and Estuary Recreation in Florida

Activity	Annual Activity Days (millions)	Value Estimates (millions $2005)	
		Low	High
Beach Visitation	177.153	$5/activity day $ 886	$50/activity day $ 8,858
Recreational Fishing	56.285	$60/activity day $ 3,377	$100/activity day $ 5,629
Marine Wildlife Viewing	77.952	$10/activity day $ 780	$100/activity day $ 7,795
Snorkeling	23.96	$10/activity day $ 240	$50/activity day $ 1,198
Scuba Diving	5.42	$15/activity day $ 81	$50/activity day $ 271
Total Potential Economic Use Value		**$ 5,364**	**$ 23,751**

Source: Pendleton, Linwood, ed. (2008). *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Restore America's Estuaries. Table 2. p. 152. Table 4. p.155; Table 6. p.159; Table 8. p. 161; Table 10. p.163; Table 12. p.164; Table 16. p.168.

Table 11 shows that 70% (9.4 million) of Florida's estuary population lives in the Everglades Watershed. This population generates 70% of the employment (3.8 million jobs) and produces $338 million, or 71% of the total GDP generated in Florida's estuaries.

Table 11. Economic Value of Everglades Estuaries

Florida Estuary Regions	Population	% of Florida Estuaries	Employment	% of Florida Estuaries	GDP (Millions)	% of Florida Estuaries
Florida Atlantic	7,947,569	59.6%	3,220,874	59.3%	$ 293,546	61.9%
Southern Gulf	1,402,660	10.5%	547,810	10.1%	$ 44,501	9.4%
Everglades Region	**9,350,229**	**70.2%**	**3,768,684**	**69.4%**	**$ 338,047**	**71.3%**
Eastern Gulf	3,978,177	29.8%	1,664,239	30.6%	$ 136,193	28.7%
Total Florida Estuaries	**13,328,406**	**100.0%**	**5,432,923**	100.0%	**$ 474,240**	100.0%

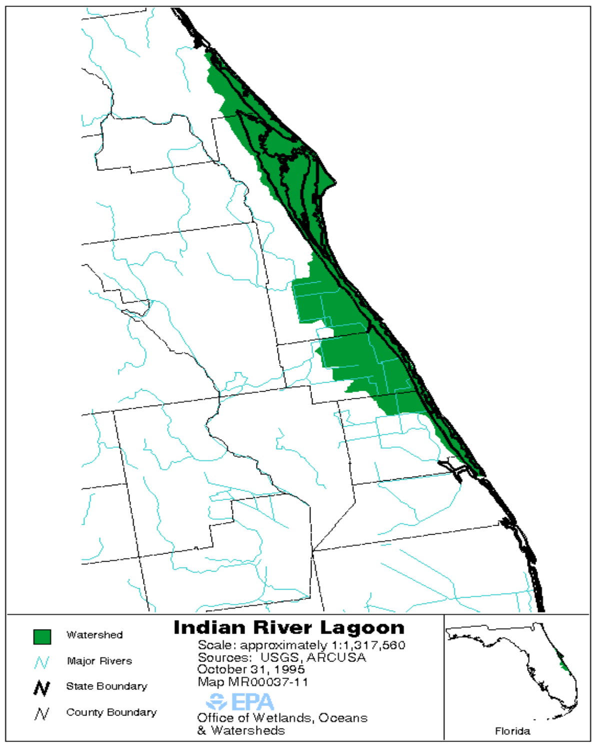
Source: Pendleton, Linwood, ed. 2008. *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Restore America's Estuaries. Table 6. p. 46.

Four Estuaries within the Everglades Watershed

Indian River Lagoon

The annual economic value of the Indian River Lagoon in its 2007 environmental condition was estimated by Hazen and Sawyer (2008).

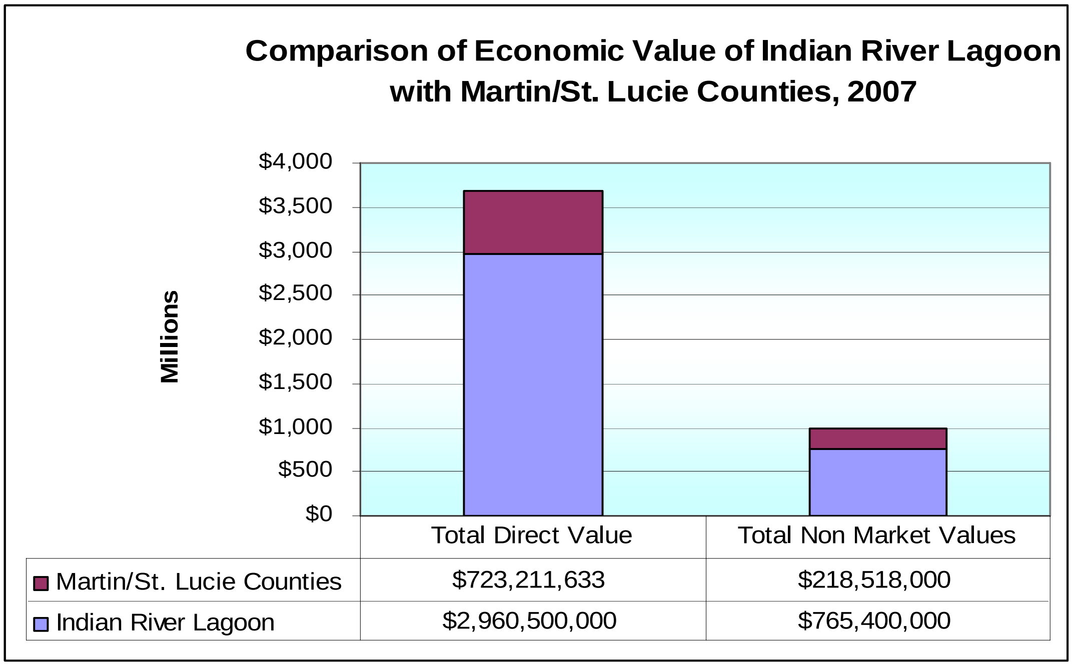
Map 5. The Indian River Lagoon



Source: U.S. Environmental Protection Agency. National Estuary Program. *Indian River Lagoon.*

The study provided estimates by county,[31] including two of the counties located in the Everglades Watershed, Martin and St. Lucie counties. The study distinguished between direct market expenditures[32] as reported in Table 12 and non-market values reported in Table 13 below (also see Figure 17).

Figure 17.



Source: Hazen and Sawyer. (2008). p.ES10-ES11.

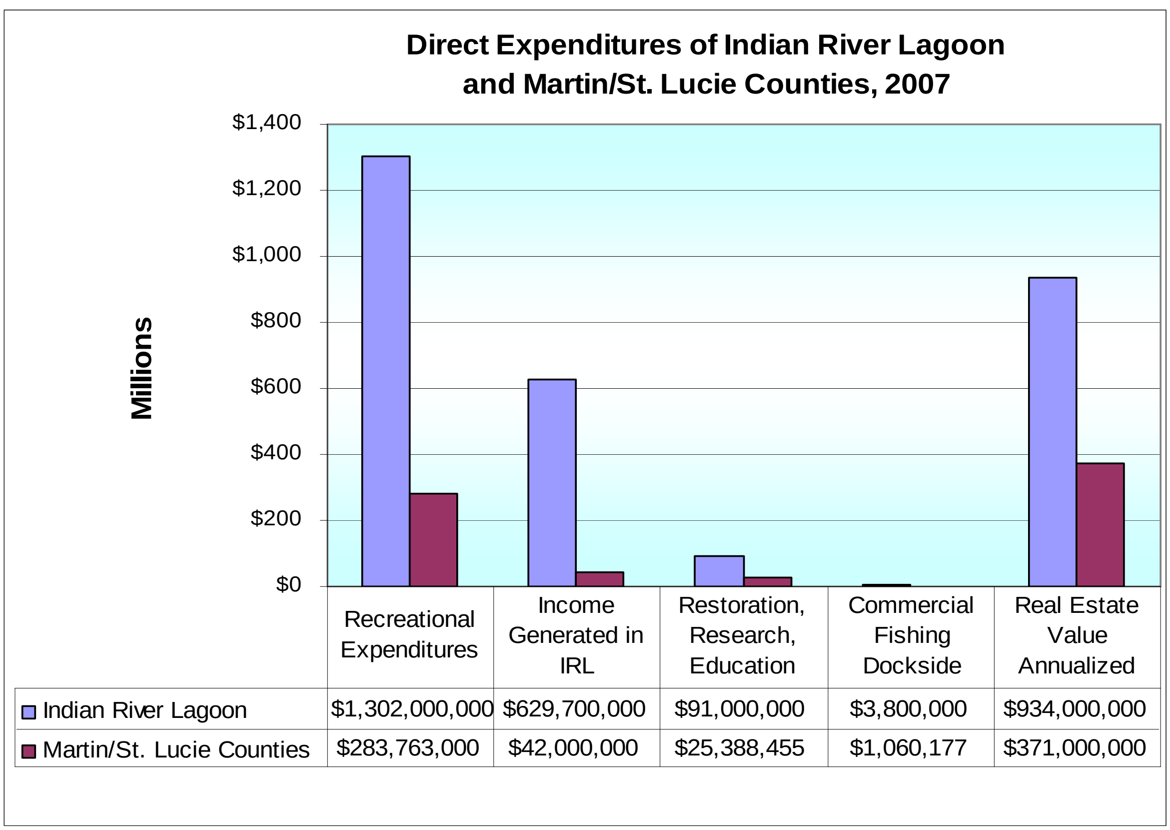
Direct market expenditures include daily recreation expenditures, boat expenditures, lodging and other related expenditures. Also included are expenditures on restoration, research and education connected with the Lagoon, annualized enhancements to real estate value and commercial fishing dockside value. The Indian River Lagoon generates $723.3 million annually in expenditures in Martin and St. Lucie counties, compared to $2.96 billion for the entire Indian River Lagoon.

Table 12. Direct Expenditures in Connection with the Indian River Lagoon in Everglades Counties

Direct Expenditure Type	Indian River Lagoon	Martin County	St. Lucie County	Total Martin/ St. Lucie Counties	% Share Total
Recreational Expenditures	$1,302,000,000	$126,745,000	$157,018,000	$283,763,000	22%
Daily Recreation Expenditures		$60,888,000	$78,068,000	$138,956,000	
Boat Expenditures in Florida		$65,857,000	$78,950,000	$144,807,000	
Lodging & Other Related Expenditures	$629,700,000	$18,000,000	$24,000,000	$42,000,000	7%
Restoration, Research, Education	$91,000,000	$9,901,768	$15,486,687	$25,388,455	28%
Commercial Fishing Dockside Value	$3,800,000	$413,480	$646,697	$1,060,177	28%
Real Estate Value Annualized	$934,000,000	$127,000,000	$244,000,000	$371,000,000	40%
Total Direct Market Expenditures	**$2,960,500,000**	**$282,060,249**	**$441,151,384**	**$723,211,633**	**24%**

Source: Hazen and Sawyer. (2008). p.ES10-ES11.

Figure 18.



Source: Hazen and Sawyer. (2008). p. ES10-ES11.

The Indian River Lagoon also generates non-market values. The recreational use value of the Lagoon is the excess value recreational users of the Lagoon would be willing to pay over and above their actual expenditures to enjoy the Lagoon. There is also a non-use value which represents the amounts non-users of the Lagoon would be willing to pay to keep the Lagoon in its existing environmental condition. This value represents the amount people would be willing to pay in order to keep the Lagoon available for recreation and other uses.

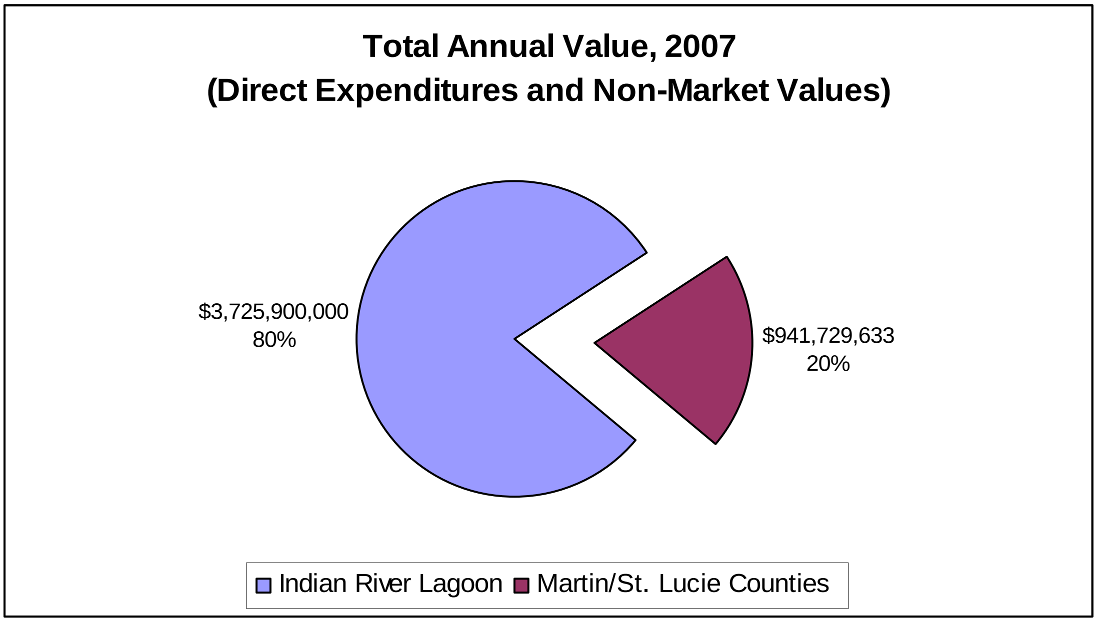
Table 13. Non-Market Values of the Indian River Lagoon in Martin and St. Lucie Counties.

Non-Market Value	Indian River Lagoon	Martin County	St. Lucie County	Total Martin/ St. Lucie Counties	% Share Total
Recreational Use Values	$762,000,000	$98,224,000	$119,532,000	$217,756,000	29%
Non-Use Values in Existing Condition	$3,400,000	$271,000	$491,000	$762,000	22%
Total Non-Market Values	**$765,400,000**	**$98,495,000**	**$120,023,000**	**$218,518,000**	**29%**

Source: Hazen and Sawyer. (2008). p.ES10-ES11.

The estimated total annual economic value of the Lagoon in its present condition is $3.7 billion (25% or $941 million is generated by Martin and St. Lucie counties).[33] The Lagoon generates a total of $2.96 billion in direct market expenditures and $765.4 million in non-market values. The percentage contribution of Martin and St. Lucie counties is 24% ($723.3 million) in direct expenditures and 29% ($219 million) in the non-market value of the Lagoon.

Figure 19.



Source: Hazen and Sawyer. (2008). p. ES10-ES11.

Biscayne Bay

Biscayne Bay is the largest estuary on the southeast coast of Florida, encompassing a marine ecosystem that is approximately 428 square miles and a drainage area that is approximately 938 square miles. It is ecologically significant, as it is contiguous with the southern Florida Everglades and the Florida Bay and supports a plethora of unique wildlife. The bay is the home of Biscayne Bay National Park, the largest marine park in the national park system, as well as many local parks.

Recreation activities of Biscayne Bay contributed 4.4% to the total output produced in Miami-Dade County. Recreation produced $2.1 billion in income, which represents 3.4% of the total income generated in the county, and sustained 57,100 jobs. Tax revenues generated by recreation accounted for 4.33%, or $2.6 million, of the county's total tax revenues (see Table 14).

Table 14. Recreation and Commercial Fishing Economic Contribution Of Biscayne Bay to Miami-Dade County, 2004

Activity	Output[1]	%	Income[2]	%	Employment	%	Tax Revenue	%
Recreation	$3,789,000,000	4.44%	$2,112,000,000	3.40%	57,100	4.42%	$257,000,000	4.33%
Commercial Fishing	$ 28,336,000	0.03%	$ 17,404,000	0.03%	469	0.04%	$ 1,837,000	0.03%
Total	**$3,817,336,000**	**4.47%**	**$2,129,404,000**	**3.43%**	**57,569**	**4.46%**	**$258,837,000**	**4.36%**

[1] Output is defined as the value of the goods and services produced in the study area due to the activity.

[2] Income is defined as the sum of labor income and other property type income.

Source: Hazen and Sawyer. (2005, April). p. ES-11-12. Table ES-3 and Table ES-4

In 2004, the economic contribution of Biscayne Bay related activities to Florida is shown in Table 15. The recreation component generated an output of $4.6 billion, or 0.7% of Florida's output; $2.6 billion in income, which represents 0.5% of Florida's income; 65,300 jobs, or 0.7% of Florida's employment; and $305 million in tax revenue, or 0.8% of Florida's economy.

Table 15. Biscayne Bay's Economic Contribution to Recreation and Commercial Fishing in Florida, 2004

Activity	Output[1]	%	Income[2]	%	Employment	%	Tax Revenue	%
Recreation	$4,567,000,000	0.71%	$2,565,000,000	0.52%	65,300	0.71%	$305,000,000	0.79%
Commercial Fishing	$ 31,118,000	0.005%	$ 18,958,000	0.004%	500	0.01%	$ 1,991,000	0.01%
Total	**$4,598,118,000**	**0.7%**	**$2,583,958,000**	**0.52%**	**65,800**	**0.72%**	**$306,991,000**	**0.8%**

[1]Output is defined as the value of the goods and services produced in the study area due to the activity.

[2] Income is defined as the sum of labor income and other property type income.

Source: Hazen and Sawyer. (2005, April). p. ES-14. Table ES-7 and Table ES-8

Biscayne Bay supports a variety of recreational activities, of which viewing, fishing, swimming, and sailing are the most important. Table 16 shows that a total of 66 million person-days were spent in recreational activities in Biscayne Bay in 2004. Visitors to the Biscayne Bay spent 36 million person-days in recreational activities, while residents spent 30 million person-days in the same activities. Viewing the Bay from the shore, while shopping, strolling, jogging, and dinning are the most popular recreational activity. Twenty-four percent of the total of the person-days spent were spent in viewing. The second most popular activity is swimming (includes swimming from shore and swimming from a boat). A total of 14.7 million (22%) person-days were spent in this activity, evenly split between visitors and residents. The third most important activity in Biscayne Bay is fishing. A total of 12.5 million person-days were spent by visitors and residents in fishing from the shore and from a boat. Fishing is a more popular activity for residents than for visitors (residents spent 7 million person-days versus 5.6 million person-days for visitors). Sailing is also an important activity, with a total of 6 million (9%) person-days dedicated to this activity.[34]

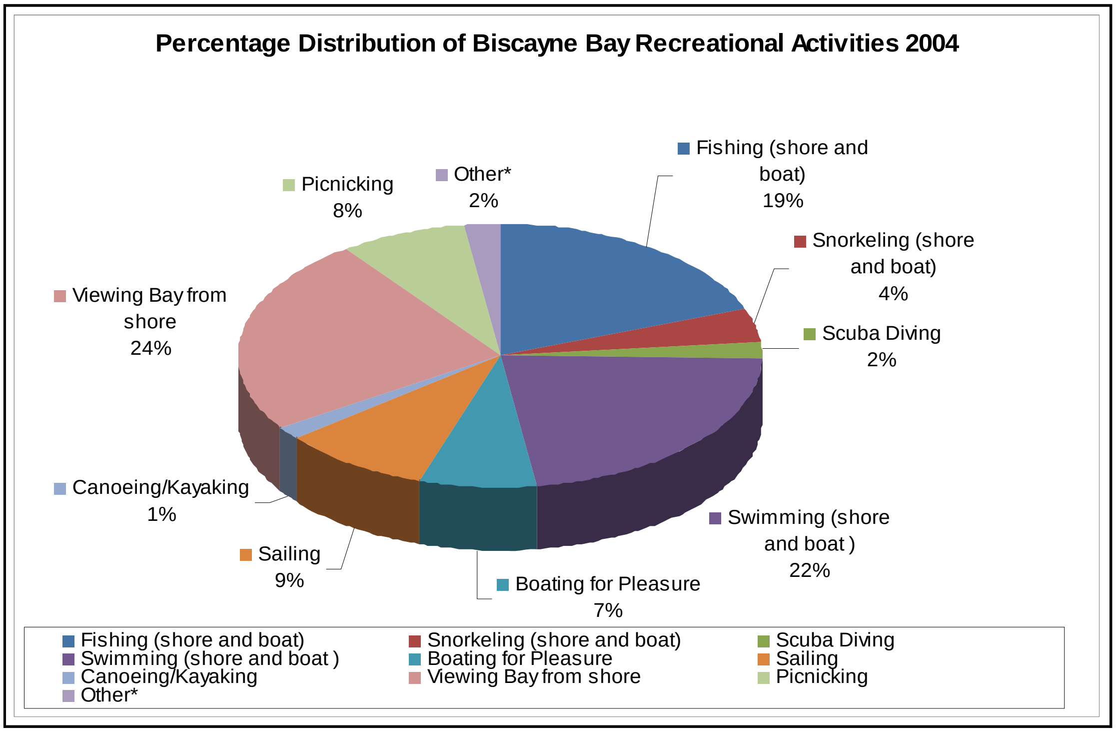
Table 16. Participation of Miami-Dade Residents and Visitors in Biscayne Bay Recreational Activities, 2004

	# Person-Days			Participation
Activity	**Visitors**	**Residents**	**Total**	**%**
Viewing Bay from shore	10,590,000	5,265,000	15,855,000	24%
Swimming (shore and boat)	7,844,000	6,863,000	14,707,000	22%
Fishing (shore and boat)	5,644,000	6,890,000	12,534,000	19%
Sailing	3,986,000	2,054,000	6,040,000	9%
Picnicking	2,547,000	2,558,000	5,105,000	8%
Boating for Pleasure	2,668,000	2,151,000	4,819,000	7%
Snorkeling (shore and boat)	1,128,000	1,598,000	2,726,000	4%
Other*	522,000	959,000	1,481,000	2%
Scuba Diving	500,000	736,000	1,236,000	2%
Canoeing/Kayaking	239,000	725,000	964,000	1%
Total	**35,668,000**	**29,799,000**	**65,467,000**	100%

Source: Hazen and Sawyer. (2005, April). p. ES-4. Table ES-1.

*Other includes Water-skiing, Parasailing, Windsurfing, Kite Surfing, Personal Watercraft, Sunset Cruise, and Glass Bottom Boat Tour.

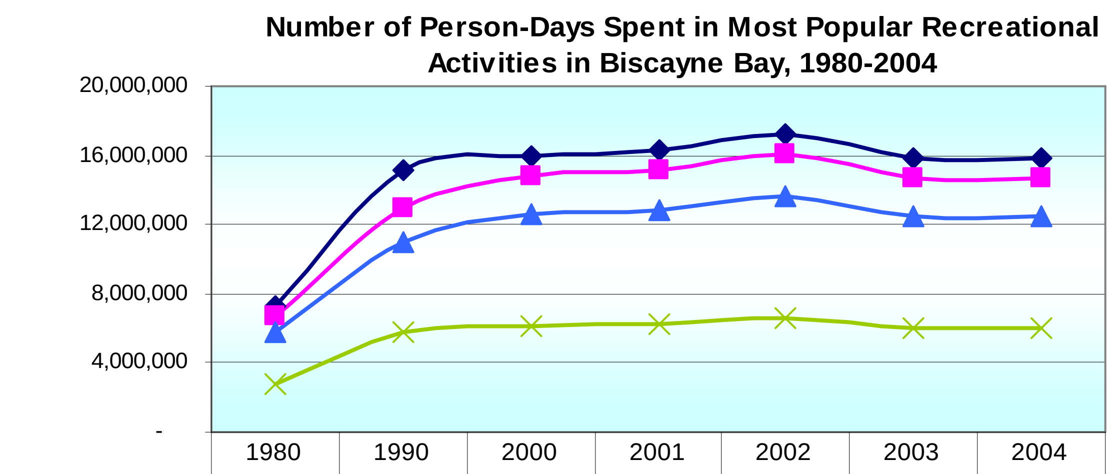
Figure 20.



Source: Hazen and Sawyer. (2005, April). p. 3-9-3-12. Table 3.2-1

The historic trend of recreation at the Biscayne Bay is shown in Figure 20. In 1980, 30 million person-days were dedicated to recreational activities, increasing in 1990 to 58 million person-days (93% increase), and growing a decade later to 66 million (14% increase) in 2000. A steady trend in number of person-days is observed from 2000 to 2004, with a slight increase in 2002. [35]

Figure 21.



	1980	1990	2000	2001	2002	2003	2004
Viewing	7,241,000	15,147,00	15,978,00	16,285,00	17,279,00	15,855,00	15,855,00
Swimming	6,718,000	12,935,00	14,821,00	15,106,00	16,028,00	14,707,00	14,707,00
Fishing	5,726,000	11,024,00	12,630,00	12,873,00	13,659,00	12,533,00	12,533,00
Sailing	2,762,000	5,776,000	6,087,000	6,204,000	6,583,000	6,040,000	6,040,000

Source: Hazen and Sawyer. (2005, April). P.3-9-3-12. Table 3.2-1

Biscayne National Park

A recent study by Hardner & McKenney (2006) examined the economic benefit of select parks in the National Park system, as well as the economic impact of park visitation and the economic growth patterns[36] associated with the parks. The study reviewed 12 case studies of parks with geographic diversity, including Biscayne National Park.[37] Population, employment, and personal income growth outpaced that of the home state in all geographic areas studied.[38]

The economic benefit and impact of Biscayne National Park in 2004 was found to be $19 million in annual recreational benefits, providing a benefit to cost ratio of more than 5:1. There were $24 million in annual visitor spending, supporting 425 local jobs (not including park staff). There were $28.9 million in sales; $11.3 million in personal income, 425 jobs, and $17.7 million value added that was contributed to the park.

Table 17. Economic Benefits for Biscayne National Park (2004)

Economic Benefits for Biscayne National Park (2004)	
Visitation	478,304
Total Recreational Benefits ($mil)	$19.10
Other Benefits*	Not Quantified
Annual Budget ($mil)	$3.40
Benefit to Cost Ratio	>5.5 to 1

*Other park benefits not quantified include ecosystem services, biodiversity, science, education, cultural, spiritual, and passive use values. The benefit-cost is conservative; it only reflects recreational benefits.

Source: Hardner, J., McKenney, B. (Nov, 2006). The U.S. National Park System: An economic asset at risk. Table on pg. 29.

Table 18. Economic Impacts for Biscayne National Park (2004)

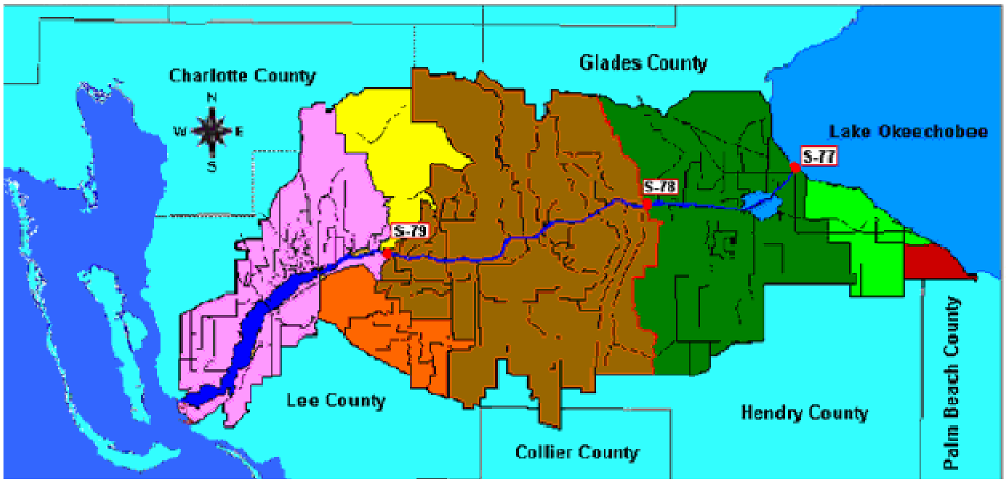
Economic Impacts for Biscayne National Park (2004)	
Visitor Spending ($mil)	$24.0
Sales ($mil)	$28.9
Personal Income ($mil)	$11.3
Jobs	425
Value Added ($mil)	$17.7

Source: Hardner, J., McKenney, B. (Nov, 2006). The U.S. National Park System: An economic asset at risk. Table on pg. 29.

Caloosahatchee Estuary

The Caloosahatchee River flows through Southwest Florida and empties into San Carlos Bay on the Florida Gulf Coast. The Caloosahatchee Estuary extends 29 miles and is part of the southern portion of Charlotte Harbor, including San Carlos Bay, Pine Island Sound, and Matlacha Pass.

Map 6. Caloosahatchee River Watershed



Source: U.S. Army Corps of Engineers & South Florida Water Management District. (2007, April). *Caloosahatchee River (C-43) West Basin Storage Reservoir*. Draft PIR & EIS. Introduction, p. 7.

The U.S. army Corps of Engineers, Jacksonville District, and the South Florida Water Management District are the responsible agencies for the Caloosahatchee River (C-43) West Basin Storage Reservoir Project. This project is part of the Comprehensive Everglades Restoration Plan (CERP), which aims at restoring the Caloosahatchee Estuary by reducing the amount of harmful discharge from basin run-off and from Lake Okeechobee. In addition, the project provides for the maintenance of a minimum water flow in the estuary during dry periods.

The Caloosahatchee Estuary is located in Region 9 of the Florida State Comprehensive Outdoor Recreation Plan (SCORP), which includes Collier, Glades, Hendry, Lee, Sarasota, and Charlotte Counties.

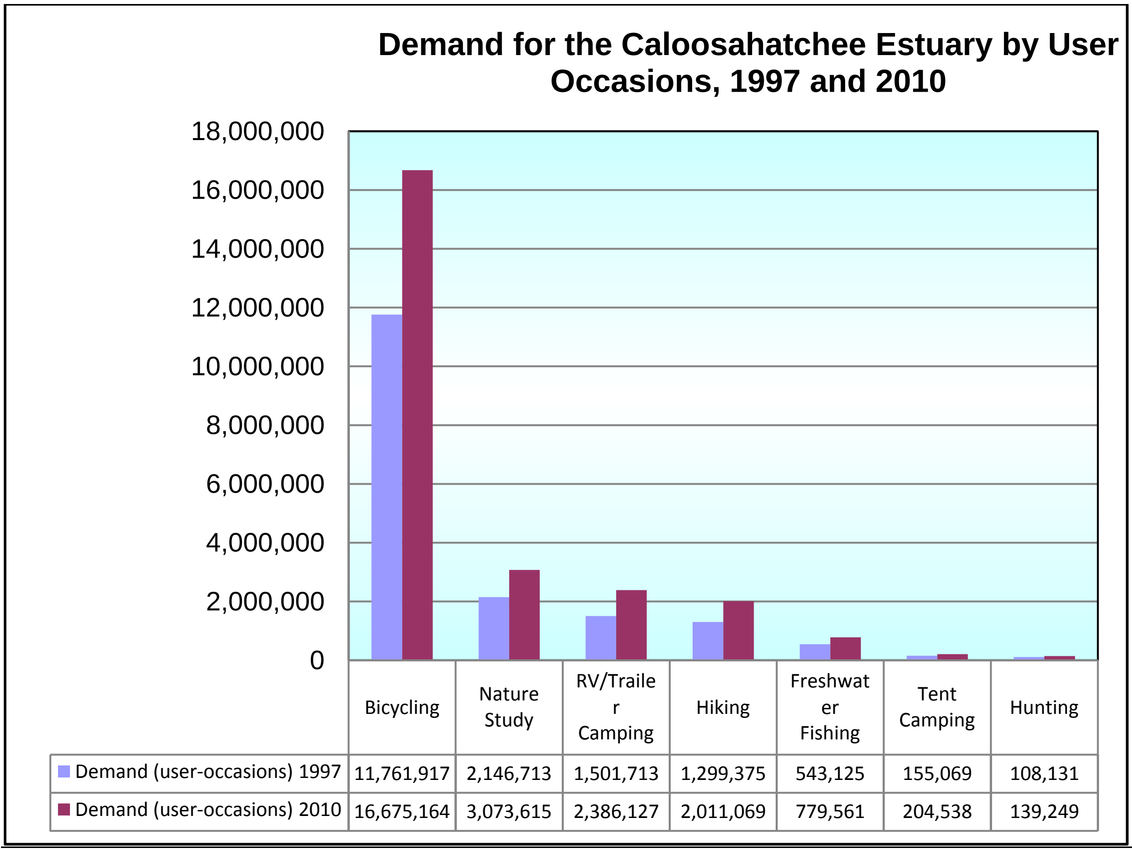
The estuary supports a large amount of recreation activities, which are estimated to increase by at least 40% by 2010. Three important activities, hiking, nature study, and bicycling lack supply of resources to support the activity.

Table 19. Demand and Facility Needs for the Caloosahatchee Estuary: Scorp Region 9:

Activity	Demand (user-occasions)			Facility Needs	
	1997	2010	estimated increase	1997	2010
Hunting	108,131	139,247	28.78%	0	0
RV/Trailer Camping	1,501,713	2,386,127	58.89%	0	0
Tent Camping	155,069	204,538	31.90%	0	0
Hiking	1,299,375	2,011,069	54.77%	213	517
Freshwater Fishing	543,125	779,561	43.53%	0	0
Nature Study	2,146,713	3,073,615	43.18%	10.87	56.8
Bicycling	11,761,917	16,675,164	41.77%	771.33	1177.08

Source: U.S. Army Corps of Engineers & South Florida Water Management District. (2007, April). *Caloosahatchee River (C-43) West Basin Storage Reservoir*. Draft PIR & EIS. Table G-21; p. G-46.

Figure 22.



Source: U.S. Army Corps of Engineers & South Florida Water Management District. (2007, April).

Economic benefits justify recreation facility investment for the project. Based on the conceptual plan, the project shows a net annual benefit of $160,000 with a benefit to cost ratio of the project at 18:1.

Table 20. Estimated Annual Recreation Costs and Benefits for C-43 Project

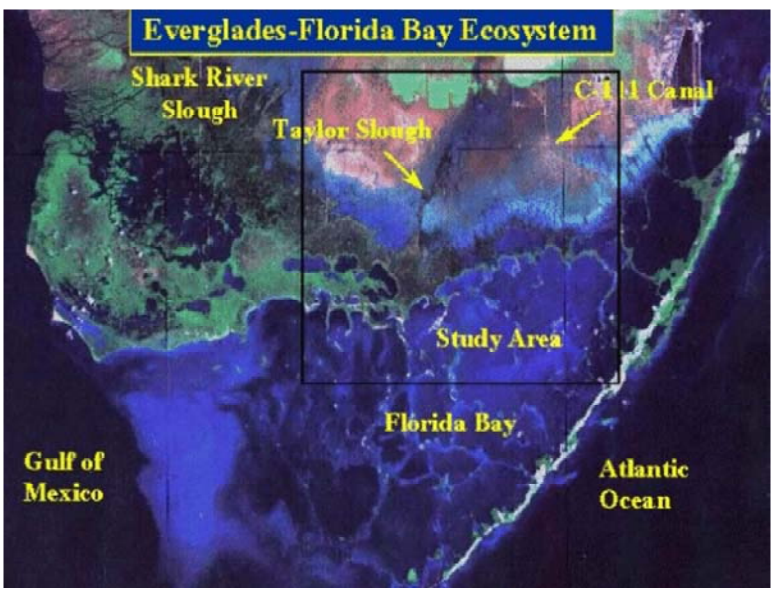
Total Recreation Investment		**$3,044,000**
Total Annual Costs		$199,000
Annual Benefits		
User Day Value	$6.79	
# of visits/year	52,925	
Total Annual Benefits		$359,361
Net Annual Benefit		$160,361

Total Recreation Investment = total recreation construction cost, $2,972,000 + interest during construction (12months) $72,000.
Source: U.S. Army Corps of Engineers & SFWMD. (2007, April). *Caloosahatchee River (C-43) West Basin Storage Reservoir.* Draft PIR & EIS. Table G-35; p. G-56.

Florida Bay

Florida Bay Estuary lies between the southern tip of the Florida Peninsula and the Florida Keys, a total of 850 square miles, of which 700 square miles are in the Everglades National Park. Florida Bay supports a variety of marine ecosystems from mangrove forests to a variety of marine animals. Economically, the Bay supports a $59 million shrimp fishery and a $22 million stone crab fishery.[39] In 2001, outdoor recreation at the Bay, such as bird watching, diving, sailing and recreational fishing, contributed $4.8 billion to Miami-Dade County and $1.1 billion to Monroe County.[40]

Map 7. Everglades-Florida Bay Ecosystem



Source: South Florida Water Management District. Watershed Management. Florida Bay/Everglades Maps.

The Monroe County Tourist Development Council, the Nature Conservancy, the Florida Keys Initiative, and the National Oceanographic and Atmospheric Administration conducted a recreational use study for the Florida Keys/Key West.

The study found that 77% of Monroe County Residents participated in outdoor recreational activities in the Florida Keys between June 1995 and May 1996. In addition, the study found that the average spending per person per day by the residents in the "export sector"[41] was $73.51 and $98.79 for all residents. Average expenditures per day for the export sector were: [42]

- Lodging: $4.31
- Food and beverages:$24.10
- Transportation: $4.46
- Boating: $16.30
- Fishing: $8.86
- Snorkeling/Scuba: $2.77
- Sightseeing: $2.77

Impacts of Visitor Spending on the Economy of the Florida City/Homestead Area, Everglades National Park

An economic study[43] of the Everglades National Park analyzing the direct and secondary effects of visitor spending[44] found $39.1 million in total local sales, $14.7 million in personal income associated with 510 jobs, and $25.5 million in additional value added for the Homestead/Florida City area. Direct sales[45] totaled $24.2 million and accounted for 370 jobs, while secondary effects added $14.9 million and accounted for an additional 140 jobs.

Table 21. Economic Impacts of Everglades National Park Visitor Spending

Economic Impacts of Everglades National Park Visitor Spending				
		Total Direct Effects	Secondary Effects	Total Effects
Direct Effects	Direct Sales $000s	$24,230	$14,912	**$39,141**
	Jobs	$370	$140	**$510**
	Personal Income $000s	$9,505	$5,224	**$14,729**
	Value added $000s	$16,202	$9,334	**$25,535**

Source: Center for Park Management, National Parks Conservation Association. (Dec, 2006). Impacts of Visitor Spending on the Economy of the Florida City / Homestead Area, Everglades National Park. Table 9.

Total recreation visits to Everglades National Park in 2004 totaled over one million, consisting of 66% out of state visitors and 39% repeat visitors.[46] Of these, 522,279 visitors are assumed to have an economic impact on the Florida City/Homestead area. The recreation visits were converted to 224,406 party nights amongst the various segments of lodging.[47]

Table 22. Visit Measures for Everglades National Parks by Lodging Segments

Visit measures for Everglades National Parks by lodging segments							
	Local day visitors	Non-local day visitors	Motel-out	Camp-out	Lodge-in	Camp-in	Backcountry
Recreation visits	8,139	219,741	150,563	28,485	78,689	34,546	2,116
Party nights	1,654	52,822	109,232	19,724	21,987	17,999	988
% Recreation Visits	1.60%	42.10%	28.80%	5.50%	15.10%	6.60%	0.40%
% Party Nights	1%	24%	49%	9%	10%	8%	0%

Source: Center for Park Management, National Parks Conservation Association. (Dec, 2006). Impacts of Visitor Spending on the Economy of the Florida City / Homestead Area, Everglades National Park. Table 6.

After the number of party nights was calculated, the total spending by Everglades National Park Visitors in 2004 was calculated. Total visitor spending amounted to $27 million, of which $24.2 million was in direct sales.[48] The highest spending was in lodging, while the second highest was in restaurants and bars.[49] Local day visitors[50] spent $48,000, while non-local day visitors[51] spent $4,460,000.

Table 23. Total Spending by Everglades National Park Visitors in 2004

Total spending by Everglades National Park Visitors in 2004 ($000s)								
	Lodging		Camping					
Spending Category	**Motel-In**	**Motel-Out**	**Camp-In**	**Camp-Out**	**Back-country Campers**	**Local day visitors**	**Non-local day visitors**	**Total**
Motel, hotel, cabin or B&B	2,031	7,601	NA	NA	NA	0	0	**9,633**
Camping fees	NA	NA	234	520	6	0	0	**759**
Restaurants & bars	888	3,580	121	708	18	0	1,467	**6,782**
Groceries, take-out food/drinks	241	866	170	377	11	15	816	**2,496**
Gas & oil	157	566	54	259	2	20	638	**1,695**
Other vehicle expenses	20	63	6	29	0	2	79	**199**
Local transportation	71	271	6	61	2	0	88	**498**
Admissions & fees	326	1,614	170	337	13	5	940	**3,406**
Clothing	0	0	0	0	0	0	0	**0**
Sporting goods	0	0	0	0	0	0	0	**0**
Gambling	0	0	0	0	0	0	0	**0**
Souvenirs and other expenses	187	784	161	115	3	6	433	**1,689**
Total	**3,921**	**15,346**	**921**	**2,406**	**55**	**48**	**4,460**	**27,157**
Percent	**14%**	**57%**	**3%**	**9%**	**0%**	**0%**	**16%**	**100%**

Source: Center for Park Management, National Parks Conservation Association. (Dec, 2006). Impacts of Visitor Spending on the Economy of the Florida City/Homestead Area, Everglades National Park. Table 8.

Linking the Economy and Environment of Florida Keys/Florida Bay

Leeworthy found that over three-quarters (77%) of 79,830 Monroe County residents participated in outdoor recreation activities in the Keys and Key West.[52] Males participated more than females (82% vs. 72%). The highest participation rate of 88% belonged to the 25-44 age group, whereas the lowest participation rate of 45% belonged to the 65 and over age group. Those with higher education and higher household income participated more. Participation declined with more years of residency. Monroe County residents participated in a wide array of recreational activities, especially fishing and snorkeling.

Table 19. Recreational Activities in Monroe County, 1996

Recreational Activities in Monroe County, 1996	
Fishing	47%
Snorkeling	45%
Beach Activities	38%
Viewing Wildlife and Nature Study	36%
Cultural Events	32%
Scuba Diving	17%
Museum or Historic Area Viewing	29%

Source: V. Leeworthy. (1996). Linking the Economy and Environment of Florida Keys/Florida Bay, Executive Summary - Resident Survey.

Resident spending on recreational activities topped $400 million in Monroe County. Spending by those residents employed outside the County or retired totaled $94 million and generated 2,414 full and part time jobs in 1996.

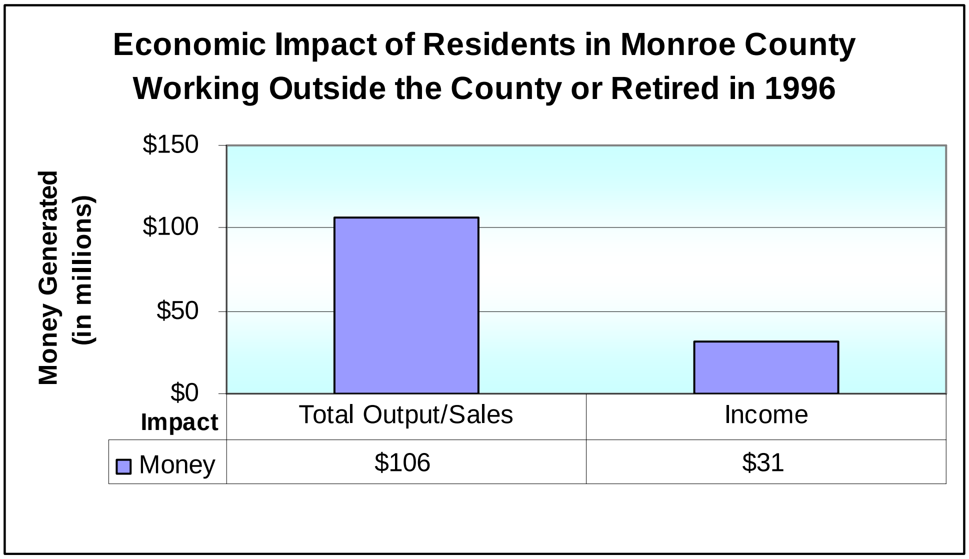
Table 20. Resident Spending on Recreational Activities in Monroe County in 1996

Resident Spending on Recreational Activities in Monroe County in 1996		
	Spending Per Day	**Total Spent**
Residents who worked outside Monroe County or retired	$73.51	**$94M**
Total Residents	$98.79	**$404M**

Source: V. Leeworthy. (1996). Linking the Economy and Environment of Florida Keys/Florida Bay, Executive Summary - Resident Survey.

The total sales output was $106 million and $31 million in income. This accounted for 5% total output/sales, 3% of all income, and about 5% of all employment.[53]

Figure 23.



Source: V. Leeworthy. (1996). Linking the Economy and Environment of Florida Keys/Florida Bay, Executive Summary - Resident Survey.

A Preliminary Assessment of the Economic Benefits of Land Conservation Areas in Florida

This report by Casey et al. (2008) was referred to in Section II. In this section, the results for the Conservation Area outside the Everglades Region are presented. It provides a preliminary estimate of the public and private economic benefits of land conservation, especially from lands that have been acquired under the three Florida state conservation programs: Conservation and Recreations Lands, Preservation 2000, and Florida Forever. The purpose of the report is to assist elected officials, the general public, business, landowners, conservation organizations, and natural resource agencies in the public policy making process regarding the level of future state acquisitions. Benefits evaluated include those associated with direct use of protected lands, such as recreation, tourism, and associated impacts on the general economy, along with some preliminary estimates of ecosystem service values. However, estimates of "non-use" benefits such as existence value, stewardship value, or bequest value are not included.

Ten state conservation areas (see Table 29) were selected based on diversity in land cover; geographical distribution throughout the state; and the number and diversity of listed species of plants and animals, many of which are common and exclusively found in Florida. These areas account for approximately 10% of the total currently protected acreage in Florida.

Table 21. Acreage of Conservation Areas

Conservation Area	Acreage
Pinhook Swamp	122,251
Babcock-Webb	72,260
Big Bend	69,112
Aucilla	42,581
Caravelle Ranch	24,869
Fisheating Creek	18,272
Lake Wales Ridge	12,601
Guana River	9,815
Florida Keys	2,269
Topsail Hill	1,626
Total Acreage	**378,656**

Source: Casey et al. (2008). A Preliminary Assessment of the Economic Benefits of Land Conservation Areas in Florida. Defenders of Wildlife Conservation Economics Working Paper. Table 32.1. p. 6.

The authors present a conceptual economic framework that distinguishes between economic "Use" values (Direct, Indirect, Multiplier Effects, and Option values) and "Passive Use" or "Non-use" values (Existence, Stewardship, and Bequest values), and their associated categories of benefits. Quantitative estimates derived from recent economic studies for some of the economic benefits that the sample conservation areas generate are then presented.

Estimating the value of ecosystem services generated by the ten conservation areas listed above included a three-stage process. First, the various ecosystem types and the corresponding acreages that are found in each conservation area were identified. Second, each of the ecosystem types were arranged by the nine non-urban ecosystem categories employed by Costanza et al. (1997): coastal, estuaries, tropical forest, temperate/boreal forests, grass/rangelands, tidal marsh/mangroves, swamp/floodplains, lakes/rivers, and cropland (grasslands and agricultural). Third, the economic values estimated by Costanza et al. (1997) for various ecosystem services (derived by converting original Costanza figures from hectares to acres and adjusting for inflation using the U.S. Consumer Price Index) were applied to those ecosystems (see Table 30).

Table 22. Ecosystem Classification, FNAI Category, and Economic Value (Dollars Per Acre)

Ecosystem Classification	FNAI Equivalent Ecosystem Category	Economic Value$/acre
Estuaries	estuarine unconsolidated substrate	11,756
Swamp/Floodplains	basin swamp, baygall, bay swamp, bottomland forest, cypress swamp, dome swamp, floodplain forest, floodplain swamp, hardwood swamp, hydric hammock, mangrove swamp, shrub swamp, slough, strand swamp, wet flatwoods	10,082
Tidal Marsh/Mangroves	basin marsh/depression marsh, cattail marsh, estuarine tidal marsh/coastal saltmarsh, floodplain marsh, freshwater marsh/wet prairie, swale;	5,144
Lakes/Rivers	blackwater stream, coastal dune lake, open water, spring-run stream;	4,375
Coastal	beach dune	2,087
Tropical Forest	maritime/tropical hammock	1,033
Temperate/Boreal Forest	exotics, hardwood hammock, mesic flatwoods, mesic hammock, pinelands, pine plantation, prairie hammock, sandhill, scrub, scrubby flatwoods, seepage slope, upland hardwood forest, upland mixed forest, xeric hammock	155
Grass/Rangelands	dry prairie, ruderal/disturbed land, shrub and bushland;	120
Cropland	grasslands and agriculture.	47

Source: Casey et al. (2008). A Preliminary Assessment of the Economic Benefits of Land Conservation Areas in Florida. Defenders of Wildlife Conservation Economics Working Paper. Table 3.6 and Table 3.7. p. 22.

The highest valued ecosystems are estuaries ($11,756/acre) and swamps and floodplains (about $10,000/acre). Tidal marshes/mangroves and lakes/rivers are the next highly valued ecosystems, at about $5,000 and $4,400 per acre, respectively. Across the 10 conservation areas, the annual average value in ecosystem service benefits is over $5,000 per acre. The total value of ecosystem services across the 10 protected conservation areas is estimated to be over $1.8 billion per year.

Results indicate that the non-market value of the natural functions of conservation lands, such as climate regulation, water supply, waste management, nutrient recycling, and disturbance regulation, can be substantial. Even if benefit levels are overestimated by 50%, the total value of ecosystem service benefits would still be over $900 million a year for the ten conservation areas alone. The authors assert that the ecosystem service benefits estimated are probably higher than $900 million/year and will rise in the future due to increasing scarcity of natural areas.

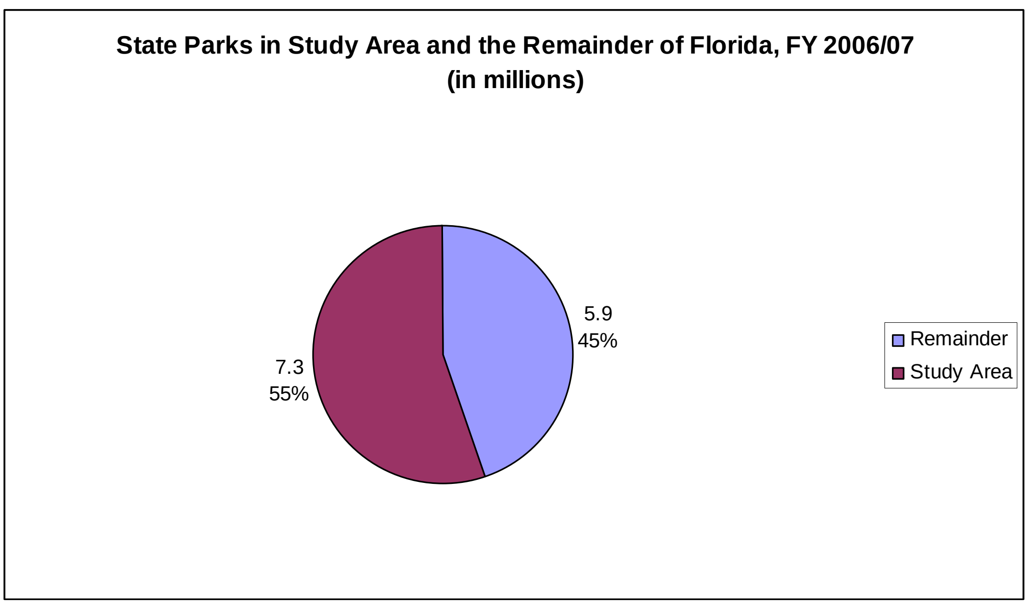
The authors conclude by proposing that the Florida Forever Program be extended and expanded to meet remaining state needs for land and water conservation. The authors also propose that a renewed Florida Forever, or successor program, spend up to $1 billion per year preserving environmentally sensitive land and wildlife habitat, buying parkland, and securing valuable water resources.

V. EVERGLADES STUDY AREA – DATA ANALYSIS OF RECREATION USES

State Park Attendance in Everglades Study Area, FY 2001 – FY 2006

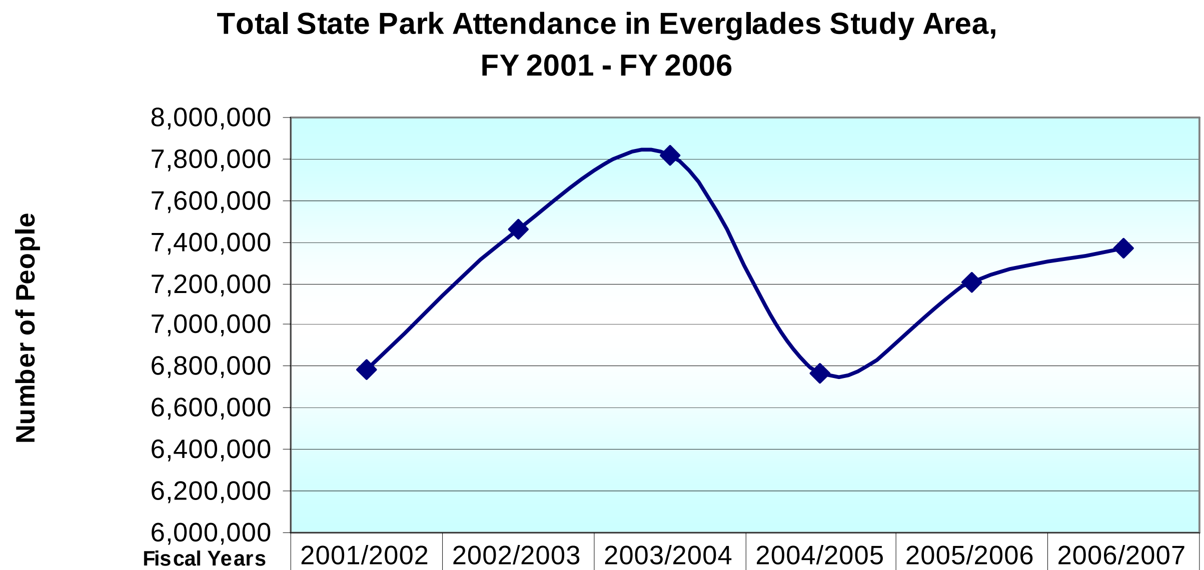
The State of Florida has 161 State Parks, covering more than 723,000 acres with 100 miles of beaches.[54] Total State Park attendance in the state was 13.2 million in FY 2006/07. State Park attendance in the Everglades study area totaled 7.3 million, or 55% of the total park attendance in the State, in FY 2006/07.[55] Total State Park attendance in the Everglades study area increased by 583,078, or 9% from FY 2001 – FY 2006, compared to a 12% increase in the State. The largest park attendance was in Monroe, Lee, and Miami-Dade Counties, with over one million annual visitors in FY 2006/07. Increased hurricane activity in 2004 and 2005 appears to have negatively impacted park attendance in the southeast and southwest coastal counties.

Figure 24.



Source: Florida Statistical Abstracts, T. 19.52, 2001-2007.

Figure 25.

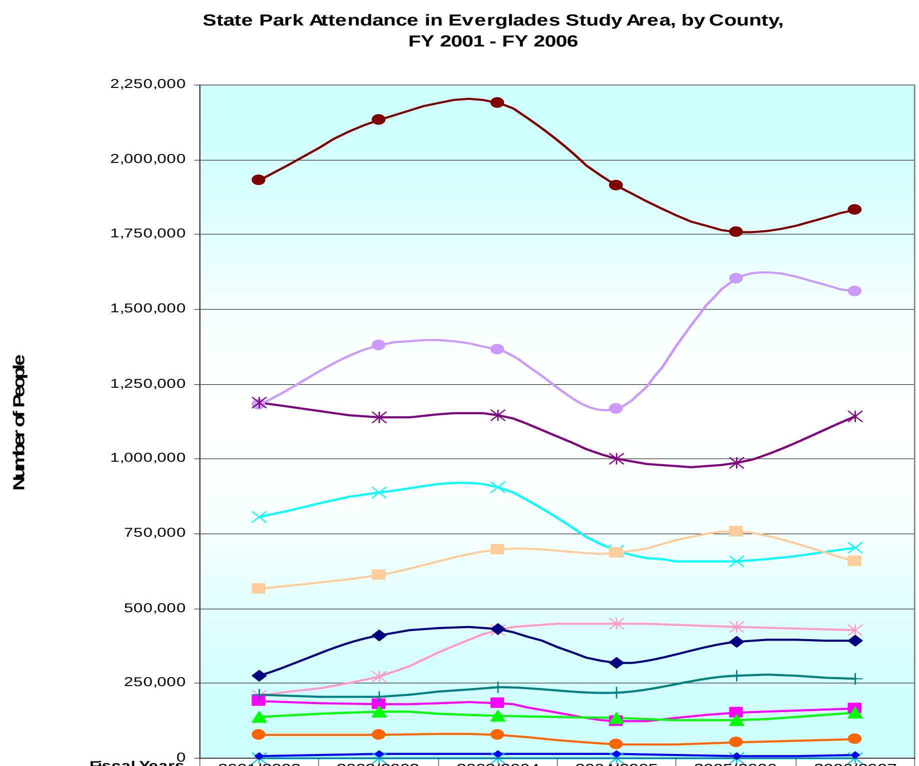


Fiscal Years	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007
Total All Counties	6,789,906	7,462,716	7,818,824	6,765,784	7,206,717	7,372,984

Source: Florida Statistical Abstracts, T. 19.52, 2001-2007.
*There were no state parks in Osceola, Glades and Hendry Counties

- Total state park attendance in the Everglades study area was 7.3 million in FY 2006/07.
- State park attendance in the Everglades study area increased by 583,078, or 9%, from FY 2001 – FY 2006, compared to a 12% increase in the State.
- Increased hurricane activity in 2004 and 2005 appears to have impacted park attendance in the southeast and southwest coastal counties.

Figure 26.



Fiscal Years	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007
Broward	807,586	886,424	906,192	694,927	656,994	703,251
Charlotte	209,706	273,150	427,472	448,253	439,043	428,213
Collier	564,883	610,951	695,825	685,422	756,197	659,756
Highlands	0	0	1,498	1,248	1,637	1,320
Lee	1,182,700	1,378,427	1,365,596	1,166,491	1,603,681	1,559,790
Martin	190,540	180,283	183,606	124,230	152,592	165,334
Miami-Dade	1,189,889	1,139,610	1,147,381	1,002,681	986,453	1,141,135
Monroe	1,931,674	2,132,888	2,189,470	1,913,182	1,756,526	1,831,746
Okeechobee	5,806	13,837	13,022	12,874	8,807	9,923
Orange	213,640	204,731	235,664	219,326	274,557	264,180
Palm Beach	139,303	155,646	141,605	134,465	127,280	151,811
Polk	78,959	77,684	79,596	44,820	54,294	64,529
St. Lucie	275,220	409,085	431,897	317,865	388,656	391,996

Source: Florida Statistical Abstracts, T. 19.52, 2001-2007.
*There were no state parks in Osceola, Glades and Hendry Counties

- State Park attendance was highest in southeast and southwest Florida counties (Monroe, Lee, Miami-Dade, Broward, & Collier counties).
- For the three counties in the Everglades study area with the highest attendance (Monroe, Lee, and Miami-Dade counties), attendance increased 5% from FY 2001 - FY 2006.
- The largest increase in park attendance was in Lee County, with an increase of 377,090 park attendees, or 32%, from FY 2001 - FY 2006.
- Increased hurricane activity in 2004 and 2005 appears to have impacted park attendance in the southeast and southwest coastal counties.

Recreational Fishing for Everglades Study Area

According to a 2006 national survey conducted by the U.S. Census Bureau for the U.S. Fish and Wildlife Service, Florida is the number one fishing destination in the United States.[56] Results indicated that Florida attracted over 2 million saltwater anglers (both residents and visitors) for more than 23.1 million fishing days (person days). The anglers spent more than $3 billion in-state, putting Florida in the lead for angler expenditures.[57]

During FY2006, a total of 417,868 recreational fishing licenses were issued in Everglades study area counties. More than half (58%) of these licenses were Saltwater Fishing Licenses, while 28% were Freshwater Fishing Licenses, and 14% were Freshwater/Saltwater combination Fishing Licenses.

Recreational Fishing by Resident Status

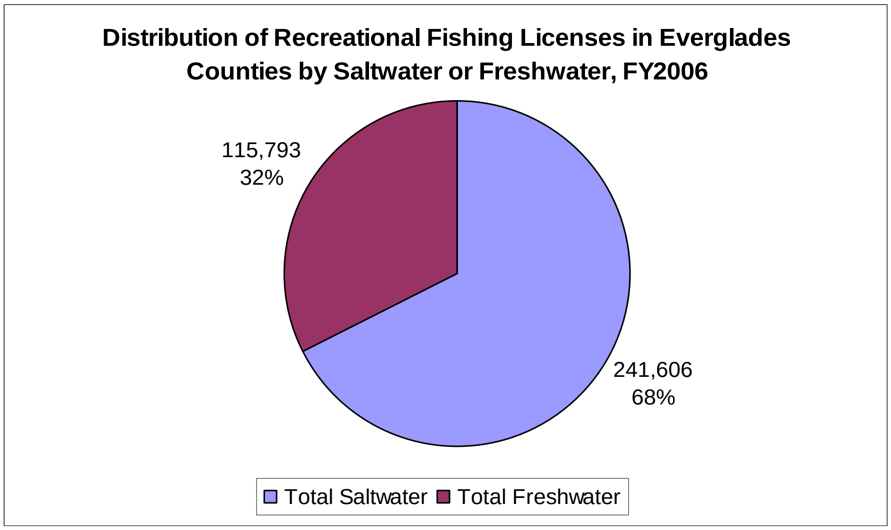
Although Saltwater Fishing Licenses were equally distributed between Residents and Visitors, Residents purchased more than half of all Freshwater Fishing Licenses. Polk County had the most Freshwater Fishing Licenses, with 70% issued to Residents. However, Monroe and Lee Counties had the greatest numbers of Saltwater Fishing Licenses, with more than half issued to Visitors.

Other Fishing Licenses—Charters, Permits, and Saltwater/Freshwater Combination

A total of 1,735 Charter Licenses were purchased in Everglades counties in FY2006. A total of 151,303 Saltwater Permits, which require possession of a Saltwater, Freshwater/Saltwater, or Charter License, were issued in Everglades counties in FY2006. Lee, Polk, and Broward Counties had the most

Freshwater/Saltwater combination Fishing Licenses, which are only available to Residents, issued in Everglades counties in FY2006.

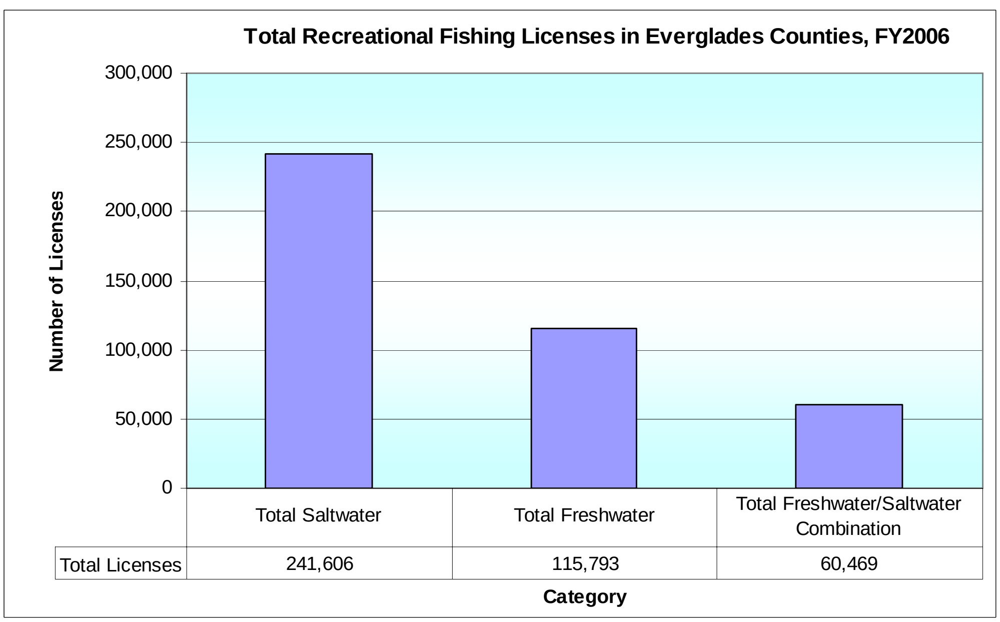
Figure 27.



Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- 68% of all Recreational Fishing Licenses were for saltwater use in Everglades counties in FY2006.

Figure 28.



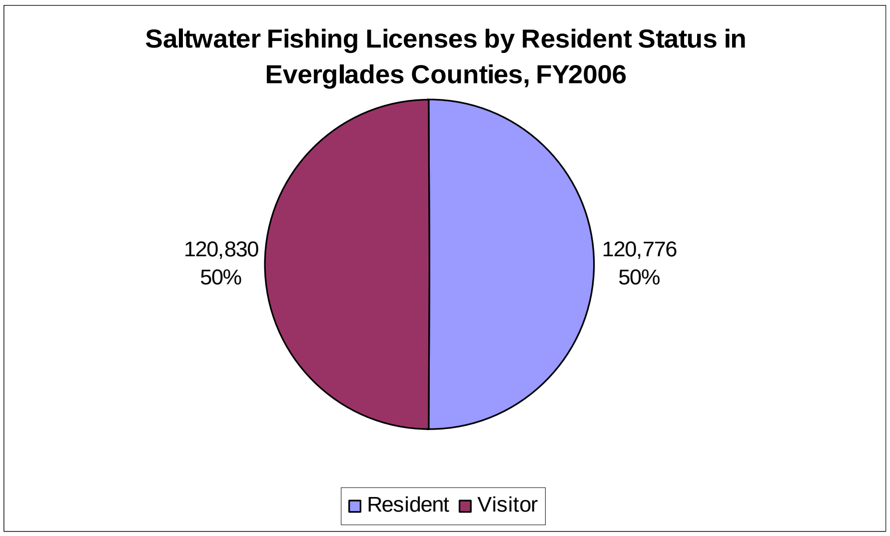
Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- Saltwater Fishing Licenses were the largest number of Recreational Fishing Licenses purchased in Everglades counties in FY2006, followed by Freshwater Licenses and Freshwater/Saltwater combination Licenses.[58]

- A total of 417,868 licenses for recreational fishing were issued to Everglades study area counties. This includes 241,606 (58%) Saltwater Fishing Licenses, 115,793 (28%) Freshwater Fishing Licenses, and 60,469 (14%) Freshwater/Saltwater Fishing Licenses.

Recreational Fishing by Resident Status[59]

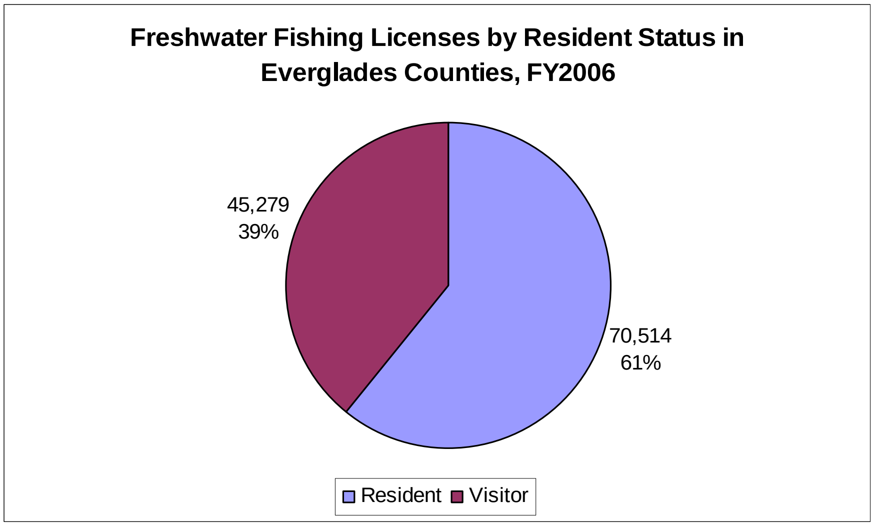
Figure 29.



Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- A total of 241,606 Saltwater Fishing Licenses were issued in Everglades counties in FY2006.
- The number of Saltwater Fishing Licenses among Residents and Visitors in Everglades counties in FY2006 was equally distributed.

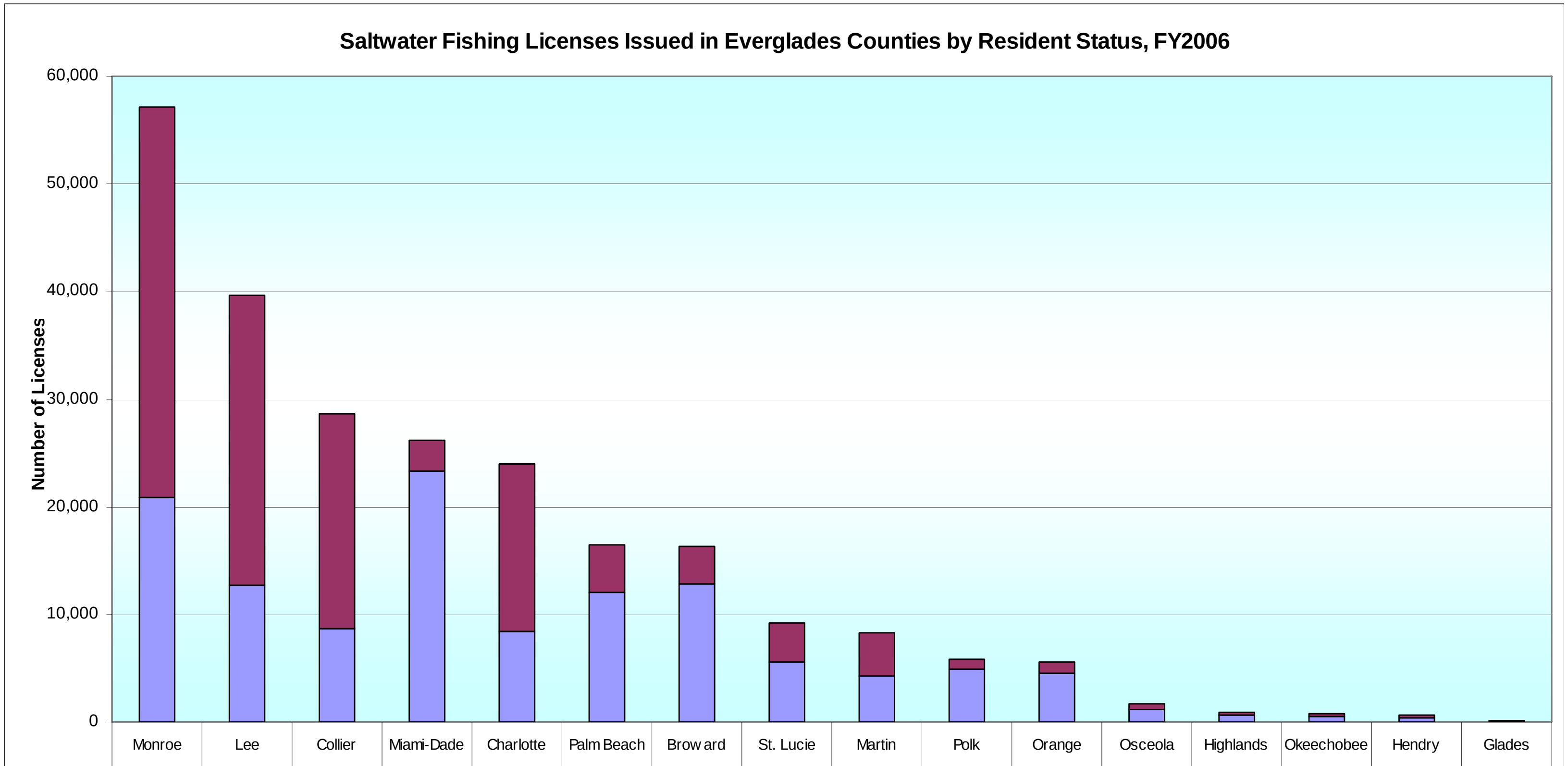
Figure 30.



Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- A total of 115, 793 Freshwater Fishing Licenses were issued in Everglades counties in FY2006.
- Residents purchased more than half of all Freshwater Fishing Licenses in Everglades counties in FY2006.

Figure 31.

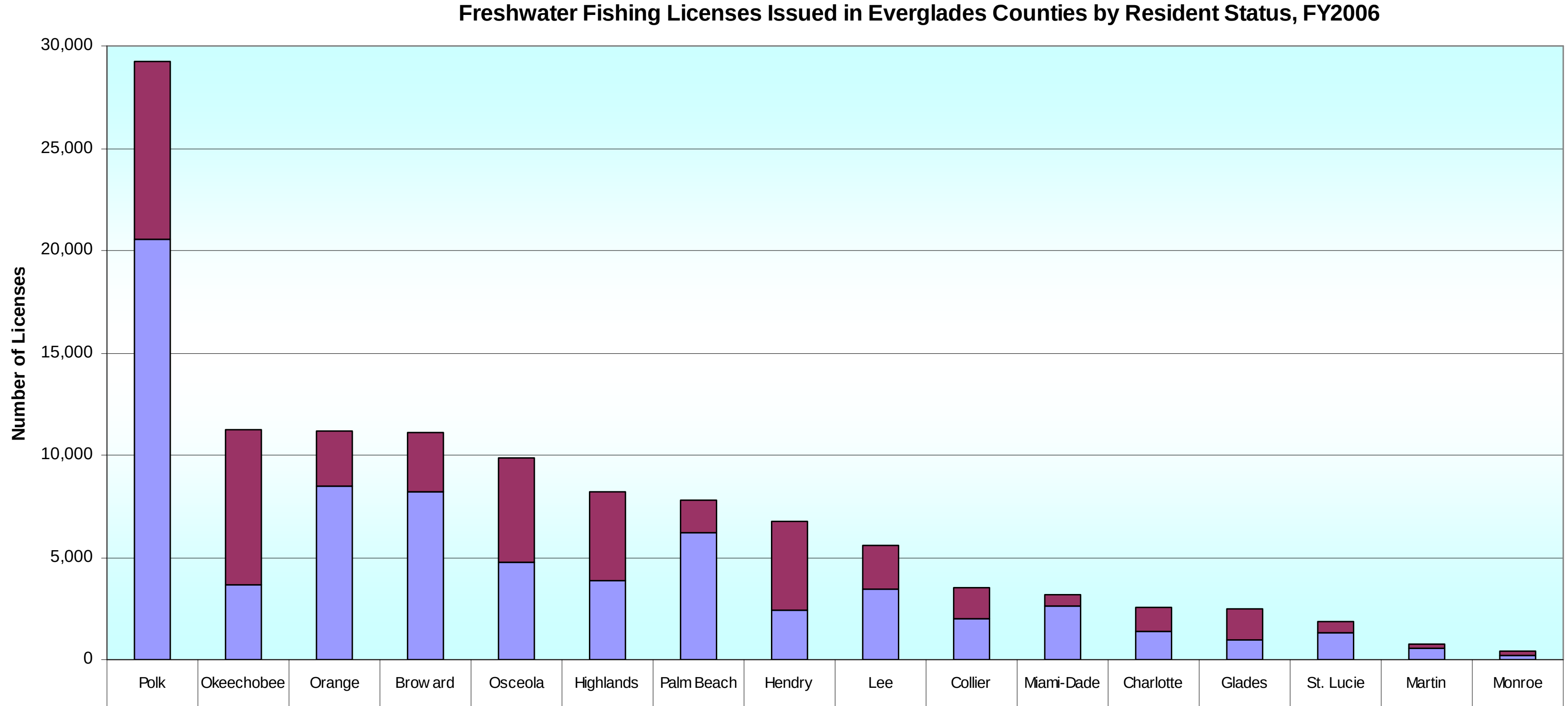


	Monroe	Lee	Collier	Miami-Dade	Charlotte	Palm Beach	Broward	St. Lucie	Martin	Polk	Orange	Osceola	Highlands	Okeechobee	Hendry	Glades
Visitor	36,318	26,964	20,010	2,858	15,491	4,387	3,573	3,738	4,060	958	1,043	595	243	296	241	55
Resident	20,809	12,684	8,644	23,359	8,450	12,028	12,811	5,512	4,230	4,879	4,590	1,126	682	540	384	48

Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- Monroe County had the most Saltwater Fishing Licenses issued in Everglades counties in FY2006

Figure 32.



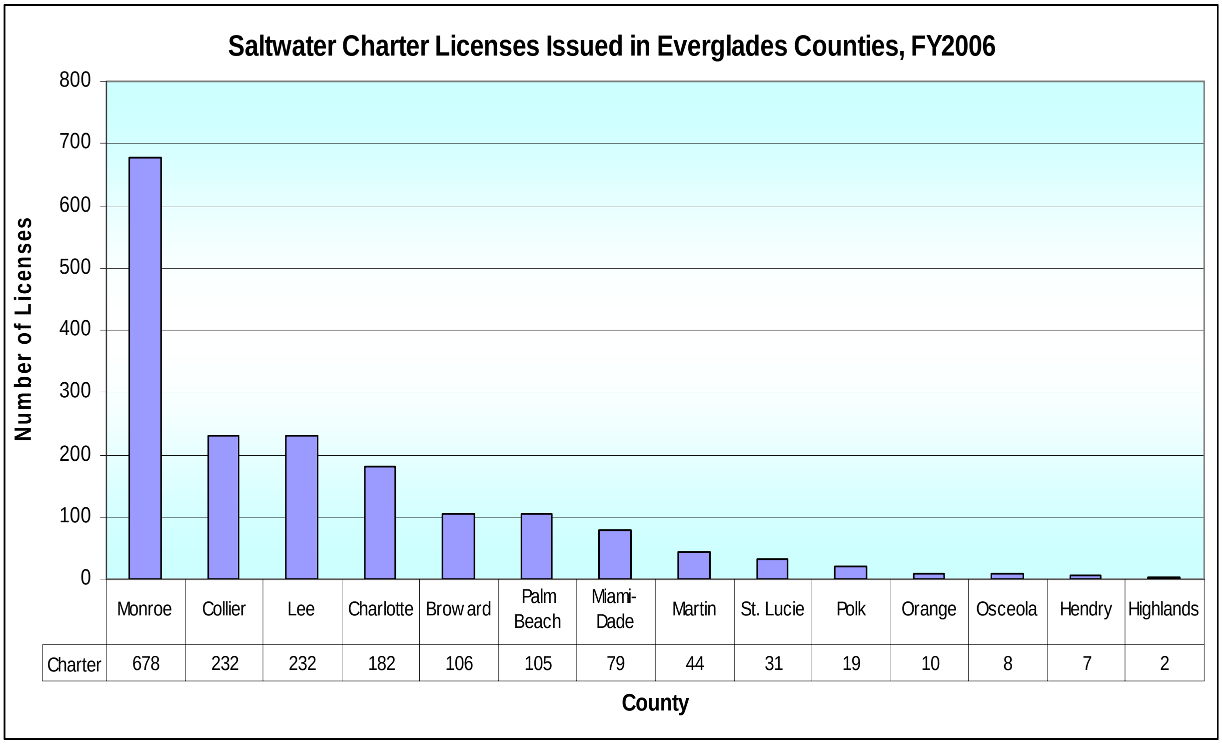
	Polk	Okeechobee	Orange	Broward	Osceola	Highlands	Palm Beach	Hendry	Lee	Collier	Miami-Dade	Charlotte	Glades	St. Lucie	Martin	Monroe
Visitor	8,676	7,578	2,727	2,923	5,144	4,313	1,584	4,382	2,185	1,489	557	1,159	1,533	535	243	251
Resident	20,555	3,634	8,466	8,185	4,744	3,881	6,179	2,406	3,418	2,007	2,648	1,410	968	1,312	528	173

Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- Polk County had the most Freshwater Fishing Licenses issued in Everglades counties in FY2006.

Other Fishing Licenses—Charters, Permits, and Saltwater/Freshwater Combination

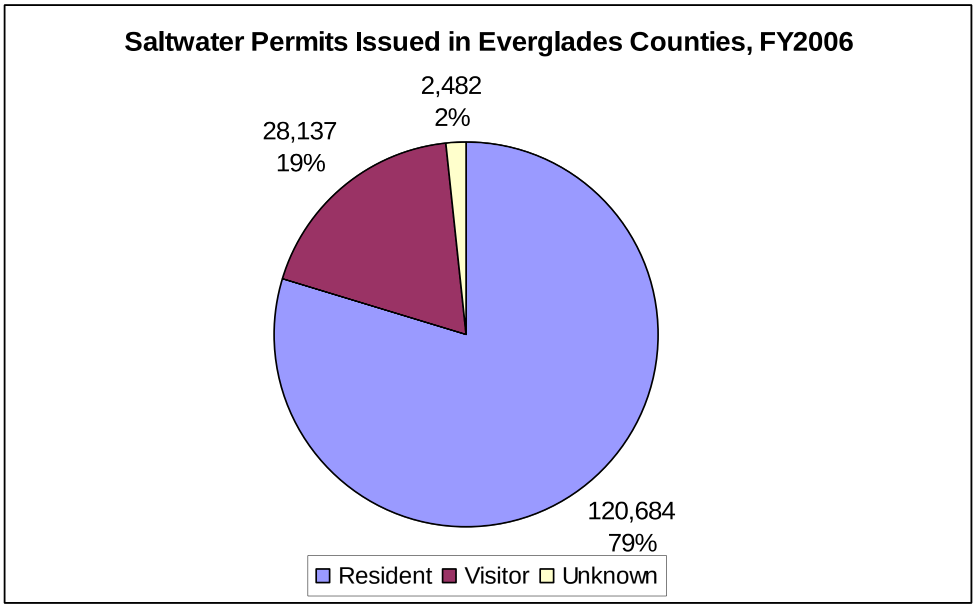
Figure 33.



Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- A total of 1,735 Charter Licenses[60] were purchased in the Everglades study area in FY2006.
- Monroe County had the highest number of Charter Licenses issued in FY2006.

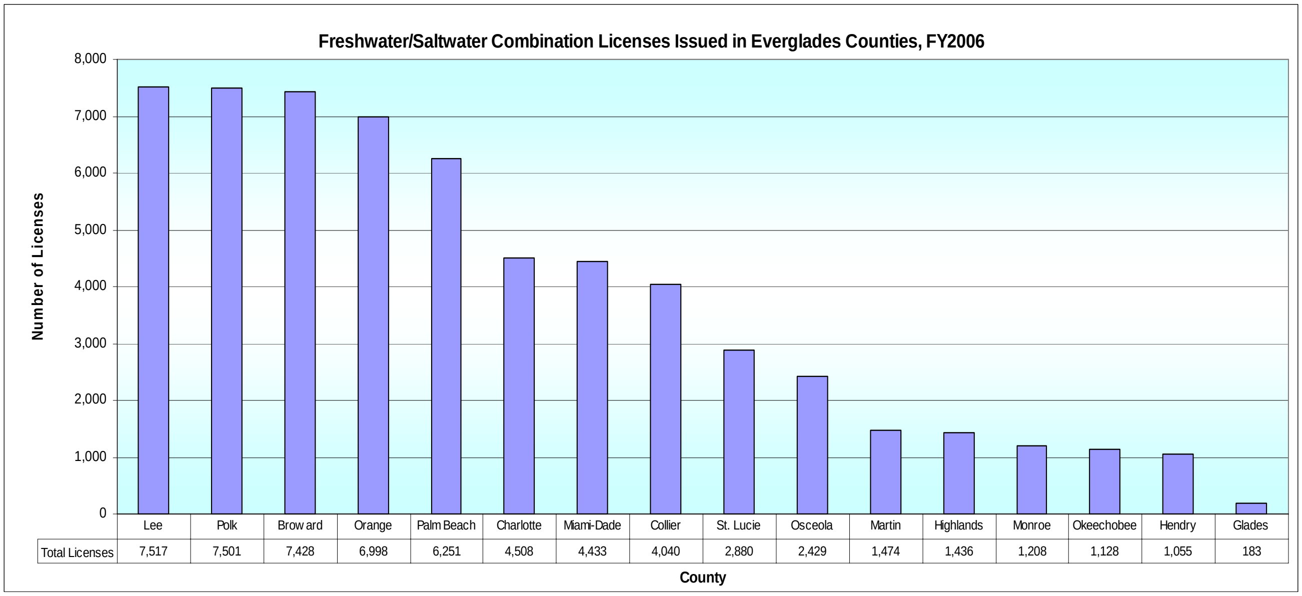
Figure 34.



Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- A total of 151,303 Saltwater Permits[61] were purchased in the Everglades study area in FY2006. All Saltwater Permits must be accompanied by a saltwater fishing or charter license.

Figure 35.



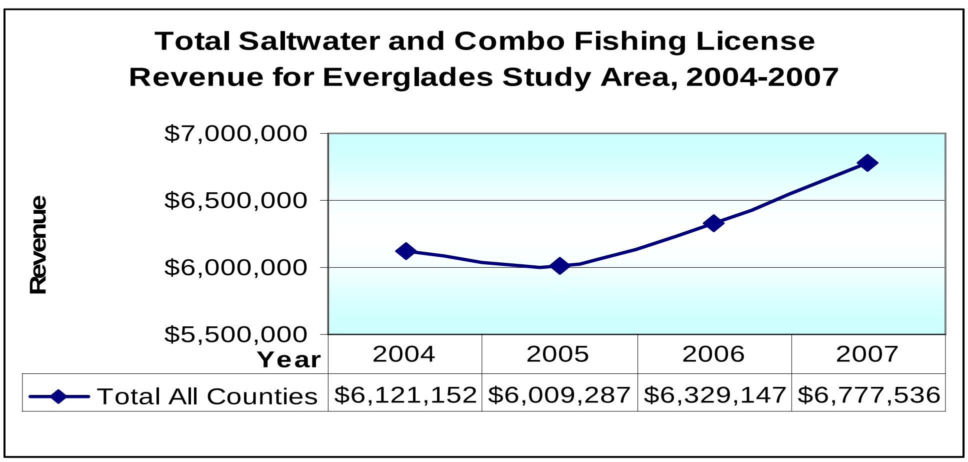
Source: FWC report provided via e-mail by Erin Rainey at FWC (January, 2008), 2004-2007.

- Lee, Polk, and Broward Counties had the most Salt/Freshwater Combination Fishing Licenses issued in Everglades counties in FY2006. It is not possible to determine the specific use in saltwater, freshwater, or both.

Total Saltwater and Combination Fishing License Revenue for Everglades Study Area

As the number one fishing destination in the United States, it is not surprising that Florida's fishing license revenues reached nearly $7 million in 2007. The economic impact of recreational fishing is measured by trip-related expenditures, equipment expenditures, and other expenditures.[62] Other expenditures include leasing and ownership, membership dues, contributions, licenses, stamps, and permits. The following charts show the importance of fishing license revenue in each of the counties of the Everglades study area. Total revenue from saltwater and combination fishing licenses has increased since 2004 in all the counties (except Glades County). Monroe, Lee, and Collier Counties account for 44%, or $2.9 million, of the total $6.8 million fishing license revenues in the study area.

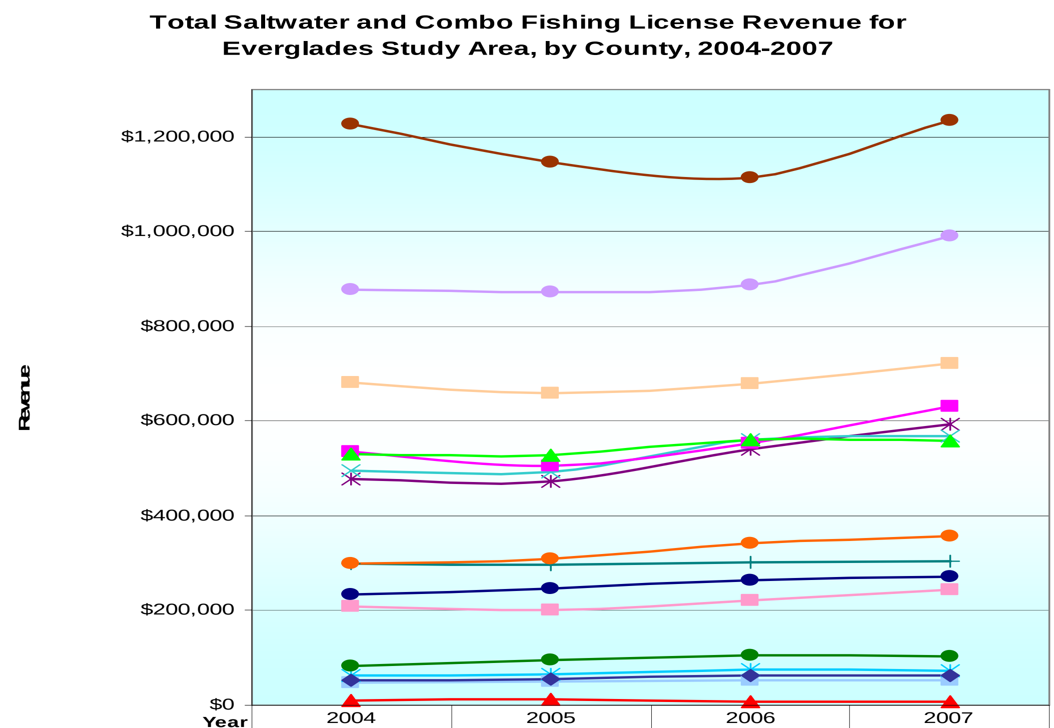
Figure 36.



Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- The total saltwater[63] and combination[64] fishing license revenue for all sixteen counties in 2007 was $6.8 million, an 11% increase from 2004.
- The study area consisted of 36% of total saltwater and combo fishing license revenue in the State for 2007.

Figure 37.



Year	2004	2005	2006	2007
Dade	$477,404	$472,304	$539,957	$592,648
Broward	$494,216	$492,783	$560,639	$569,111
Charlotte	$535,247	$506,386	$554,193	$631,309
Collier	$680,757	$657,864	$678,220	$721,870
Glades	$10,261	$13,316	$8,798	$8,651
Hendry	$48,211	$49,786	$51,841	$53,069
Highlands	$63,403	$64,415	$75,005	$73,750
Lee	$877,719	$872,003	$888,764	$990,650
Martin	$209,090	$201,874	$221,225	$243,346
Monroe	$1,227,817	$1,147,784	$1,114,856	$1,235,291
Okeechobee	$52,644	$56,501	$63,116	$63,356
Orange	$298,432	$295,466	$301,856	$304,560
Osceola	$83,987	$94,525	$104,718	$102,464
Palm Beach	$529,605	$528,137	$559,999	$558,097
Polk	$299,384	$308,722	$341,091	$358,151
St. Lucie	$232,975	$247,424	$264,873	$271,215

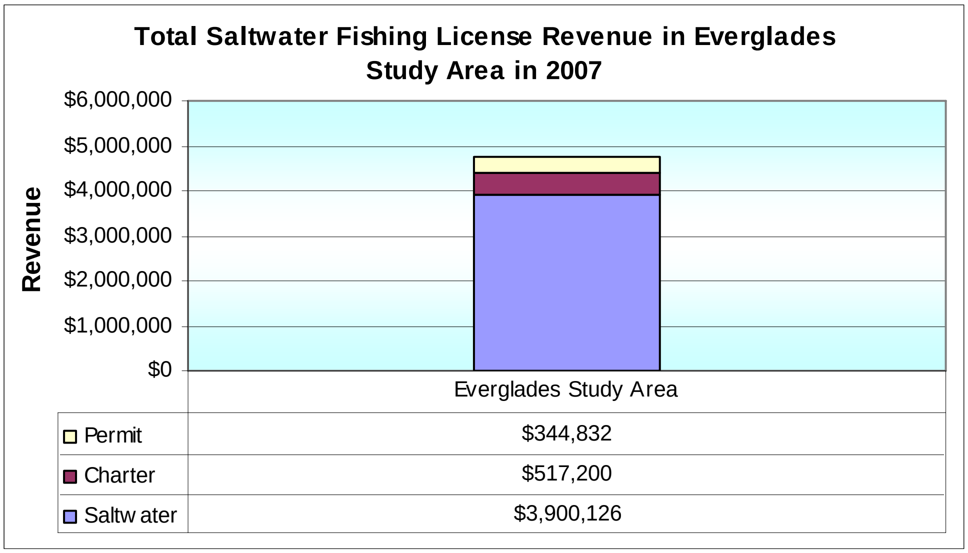
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- The county with the highest fishing license revenue in 2004, Monroe County, only saw only a .6% increase through 2007 and yet still remained the highest in 2007.
- All the counties saw an increase from 2004 to 2007, except for Glades County which saw a 16% decrease.
- Miami-Dade County saw the greatest increase of $115,244, or 24%, from 2004-2007.

Total Saltwater Fishing License Revenue in the Everglades Study Area, 2007

Saltwater fishing license revenue, including permits and charters, totaled $4.7 million in the Everglades study area in 2007. Of the total saltwater license revenue, 18% was made up of license revenues from charter boats and permits.

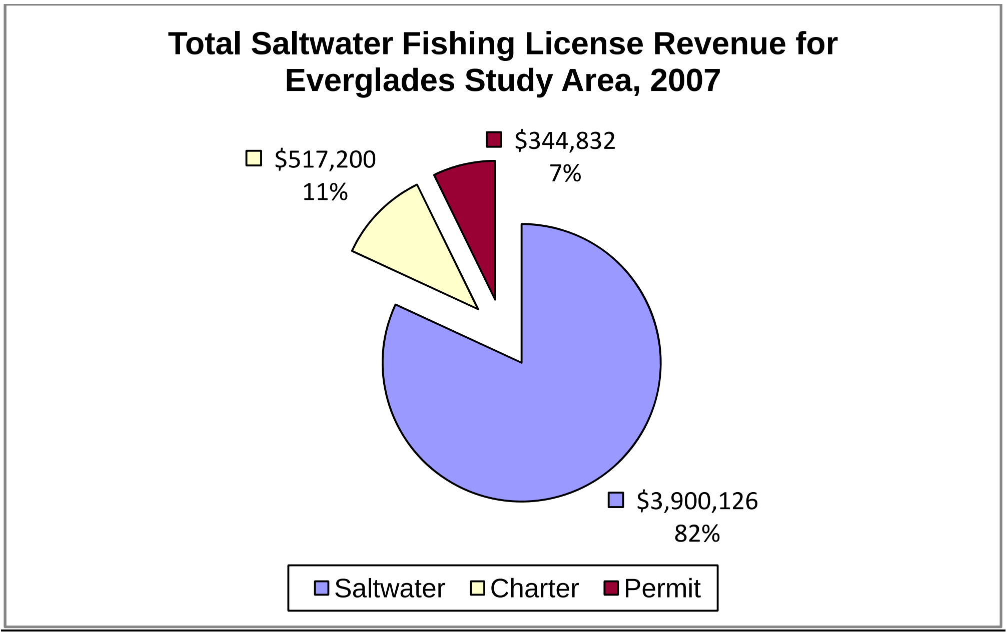
Figure 38.



Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

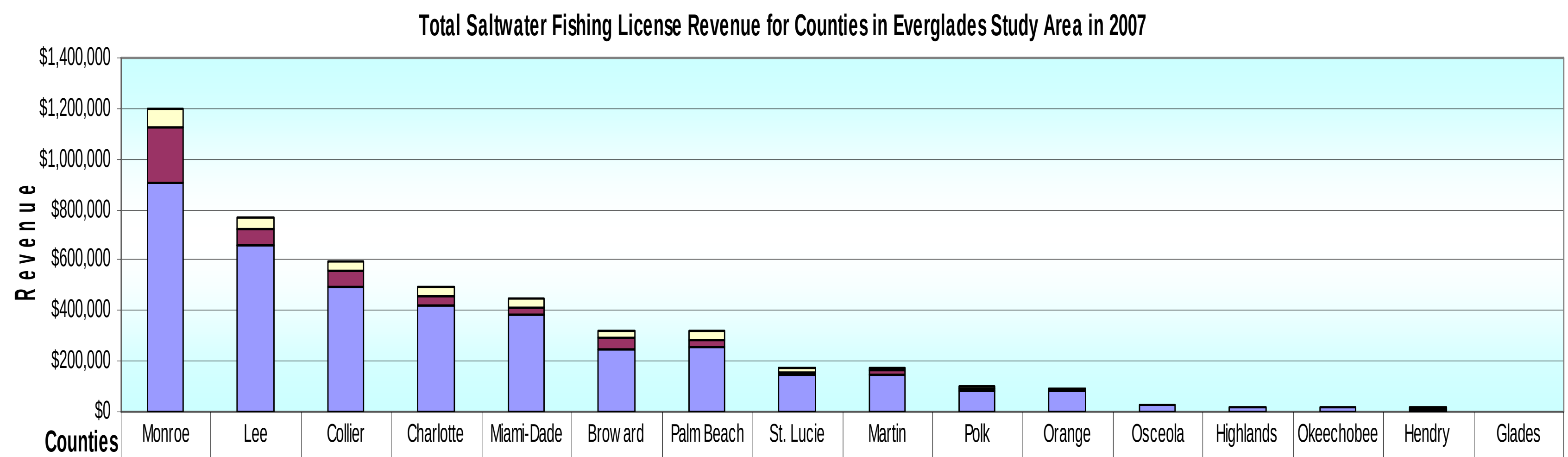
- Total saltwater fishing license revenue[65], including permits and charters, for the Everglades study area in 2007 was $4,762,158.
- Combo license revenue, totaling $2 million, includes licenses which can be used for both saltwater and freshwater fishing and were not included in this chart.[66]
- Of the total saltwater license revenue, $862,032, or 18%, was made up of charter boats and permits.[67]

Figure 39.



Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

Figure 40.



Counties	Monroe	Lee	Collier	Charlotte	Miami-Dade	Broward	Palm Beach	St. Lucie	Martin	Polk	Orange	Osceola	Highlands	Okeechobee	Hendry	Glades
Permit	$64,858	$45,780	$33,754	$34,320	$40,964	$32,538	$30,316	$18,488	$15,390	$11,606	$7,894	$2,138	$2,452	$1,968	$2,030	$336
Charter	$219,400	$60,200	$61,600	$43,600	$23,600	$42,800	$32,000	$7,400	$16,600	$4,000	$2,000	$1,800	$400	$0	$1,800	$0
Saltwater	$910,338	$659,987	$496,140	$416,690	$386,225	$249,069	$253,556	$147,754	$143,986	$84,452	$85,787	$24,594	$14,670	$14,302	$11,104	$1,472

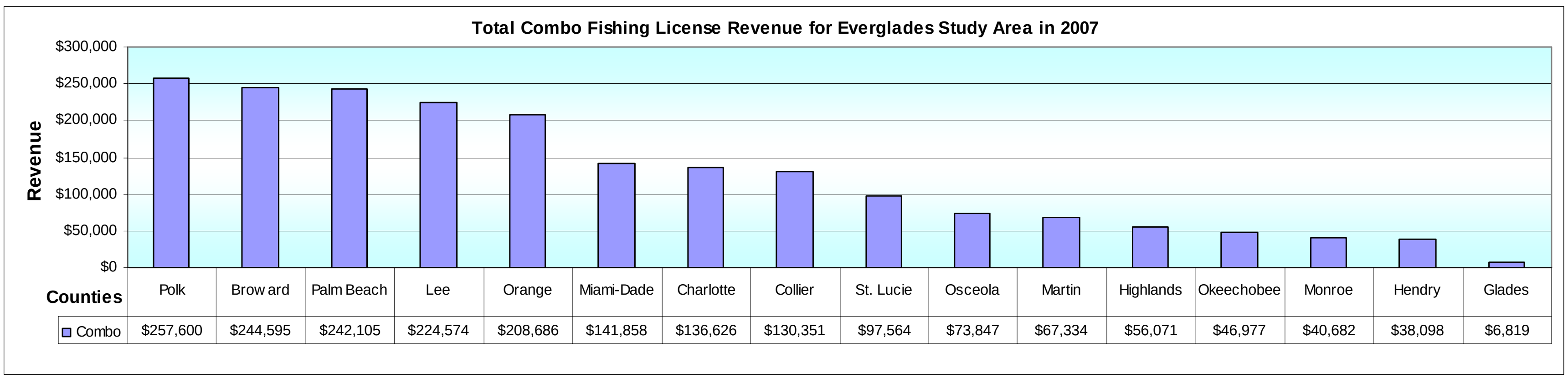
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Total saltwater license revenue, including permits and charters, for the Everglades study area was $4,762,158 in 2007. Saltwater permits accounted for $344,832, or 7%, in revenue; charters accounted for $517,200, or 11%, in revenue; and saltwater licenses alone accounted for $3,900,126, or 82%, in revenue.
- Monroe County had the highest revenue, $1,194,596, or 25%, for total saltwater fishing licenses, permits, and charters of all counties in the study area in 2007.

Total Combination Fishing License Revenue for Everglades Study Area in 2007

Combination fishing licenses allows for both saltwater and freshwater fishing. In the Everglades study area in 2007, combo fishing license revenue totaled over $2 million. The five highest revenue counties accounted for $1.2 million, or 58%, of the total combo fishing license revenue. The lowest five counties accounted for $188,647, or 9%, of the total combo fishing license revenue.

Figure 41.



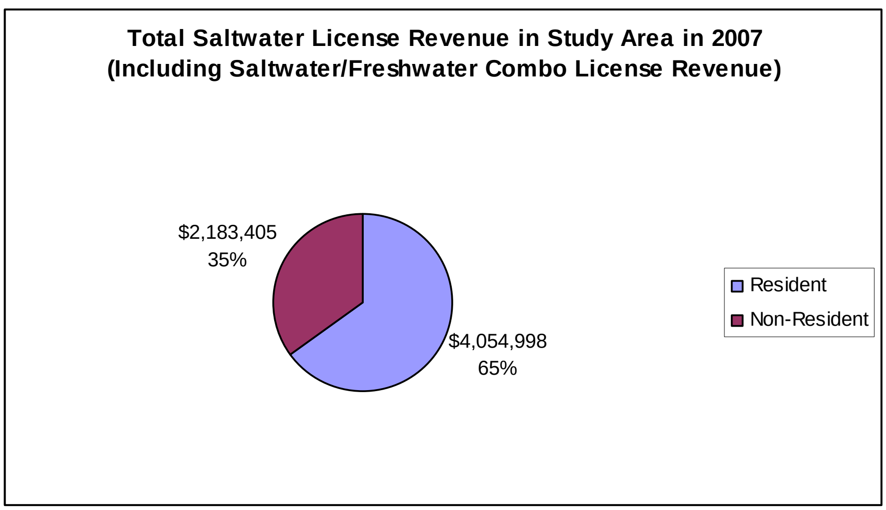
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Total Combo fishing license revenue for the Everglades study area in 2007 was $2,013,787.
- Polk, Broward, Palm Beach, Lee, and Orange Counties have the highest Combo fishing license revenue of $1,177,560, or 58%, of all counties in the study area.[68]
- The lowest five counties of Highlands, Okeechobee, Monroe, Hendry, and Glades, totaled $188,647, or 9%, of all counties in the study area for Combo fishing license revenue.

Total Saltwater and Combination Fishing License Revenue for Residents and Non-Residents, 2007 for Everglades Study Area

Fishing licenses in the State of Florida are sold to both residents and non-residents. Total saltwater and combination fishing license revenue in the Everglades study area was $6.2 million in 2007.[69] Residents make up the majority (65%) of the total, compared to non-residents at 35% of the total. The four counties with the highest revenue-- Monroe, Lee, Collier, and Charlotte-- had a greater share of non-resident revenue, while residents dominate in the other counties in the study area. Residents are defined as those who have resided in the State for six consecutive months and who claim Florida their primary residence. Those in the United States Armed Forces stationed in Florida are also considered residents.[70]

Figure 42.

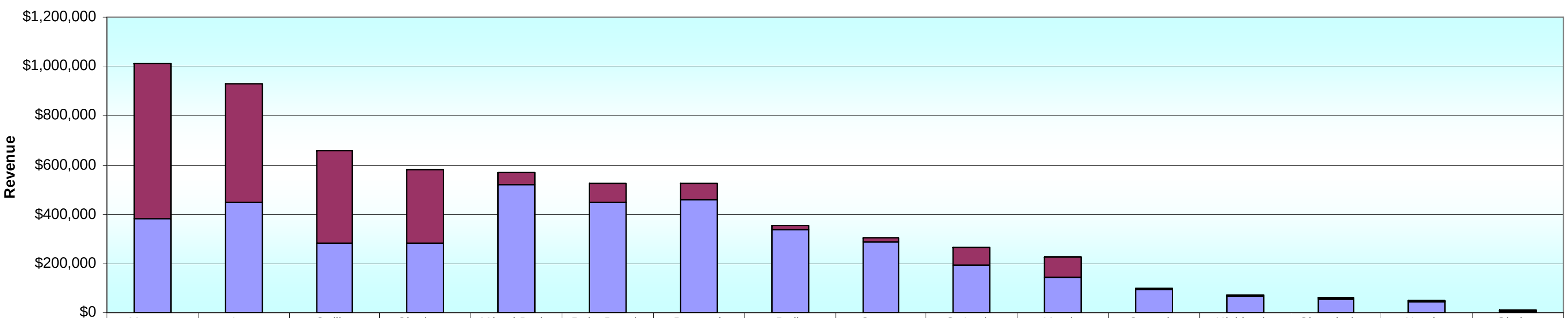


Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow.

- Saltwater and combo license revenue from non-residents made up only 35% of the total saltwater combo license revenue in the study area in 2007.
- Combo licenses accounted for $2,013,787 of the total 2007 fishing license revenue in the study area and were only sold to residents.
- Saltwater licenses, including permits, accounted for $2,041,211 spent by residents compared to $2,183,405 spent by non-residents.

Figure 43.

Saltwater Fishing License Revenue For Each County in Study Area in 2007 (Including Saltwater/Freshwater Combo Licenses)



County	Monroe	Lee	Collier	Charlotte	Miami-Dade	Palm Beach	Broward	Polk	Orange	St. Lucie	Martin	Osceola	Highlands	Okeechobee	Hendry	Glades
Non-Resident	$626,782	$481,395	$372,678	$297,747	$50,229	$79,780	$64,212	$14,667	$15,771	$69,944	$84,292	$8,357	$4,571	$6,510	$5,352	$1,118
Resident	$383,648	$445,362	$284,755	$284,621	$517,792	$445,867	$460,434	$338,951	$286,576	$193,784	$142,268	$92,214	$68,616	$56,737	$45,864	$7,509

Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow.

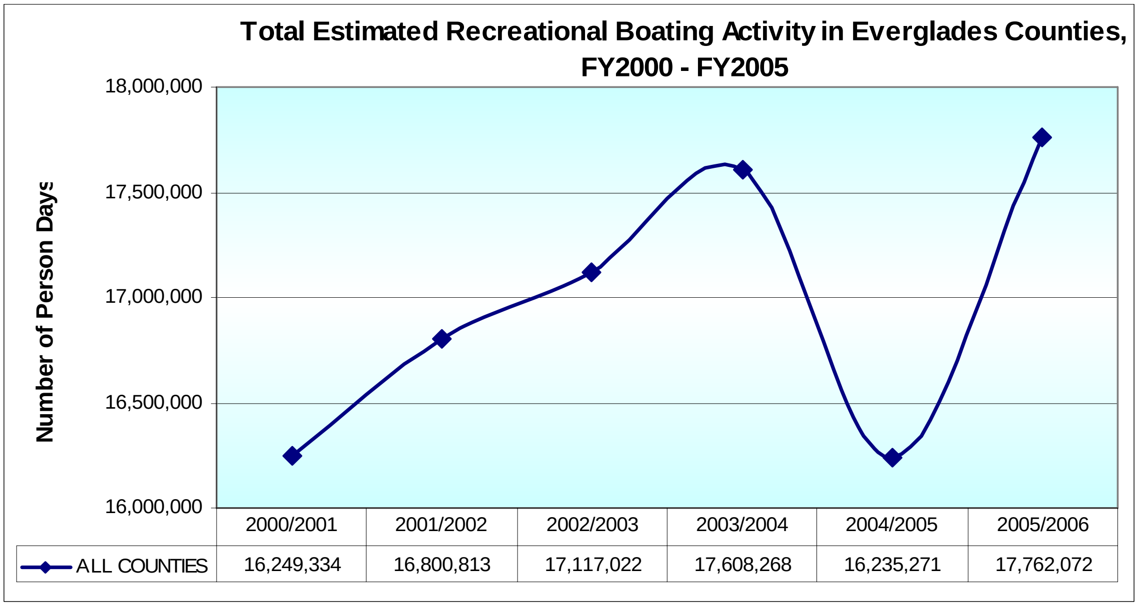
- The highest total saltwater and combo fishing license revenue was in Monroe County with $1,010,430.
- The highest non-resident fishing license revenue was also in Monroe County with $626,782.
- The highest resident fishing license revenue was in Miami-Dade County with $517,792.

BOATING ACTIVITY FOR EVERGLADES STUDY AREA

Florida has approximately 10,000 miles of streams and rivers, 8,500 miles of tidal coastline, and two million acres of freshwater lake surface, offering an array of recreational boating activity opportunities. In 2007, Florida had more than one million registered or titled vessels, of which 97% were registered as recreational.[71] According to a 2006 Boating Survey, the average number of people (including the primary operator) on a boat during a typical outing in Florida is approximately four.[72]

Data from Sidman, C., et al. were used to estimate the recreational boating activity days for counties in the Everglades study area.[73] Estimated activity days increased in the Everglades counties from FY2000 to FY2005, with a percent change of 9.31. However, in FY2004 there was a sharp decline in estimated activity days due to the highly active 2004 hurricane season. Highlands (23.07%), Glades (22.09%), Osceola (19.78%), and Lee (19.01%) Counties experienced the highest percent changes in boating activity days from FY2000 to FY2005. However, Miami-Dade (16.3M), Broward (13.8M), Lee (13.6M), and Palm Beach (12.5M) counties had the greatest total number of estimated boating activity days from FY2000 to FY2005.

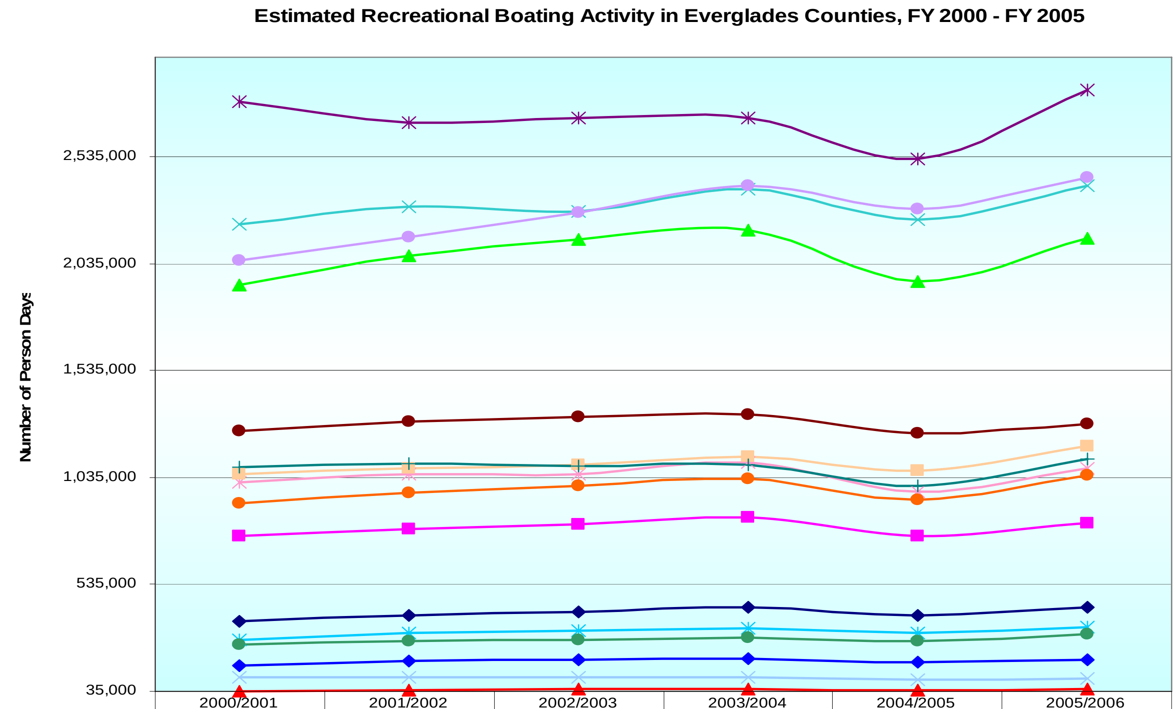
Figure 44.



Source: Sidman, C., et al. 2005-2007.

- Using Sidman, C., et al. data, it is estimated that recreational boating person days increased 10% from FY2000 until FY2005. In FY2004, the estimated number of person days decreased dramatically due to the highly active 2004 hurricane season.[74]
- The highest number of person days was in FY2005, at 16.2 Million.

Figure 45.



	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Broward	2,218,396	2,303,534	2,279,261	2,381,103	2,241,572	2,398,016
Charlotte	1,013,776	1,048,646	1,052,874	1,105,753	971,233	1,077,095
Collier	1,052,665	1,080,592	1,095,939	1,133,732	1,067,542	1,182,643
Glades	36,919	41,217	43,789	45,481	41,149	45,075
Hendry	98,238	102,400	99,117	99,760	87,206	93,398
Highlands	273,901	308,079	318,231	328,891	306,252	337,080
Lee	2,048,641	2,156,695	2,276,442	2,398,590	2,287,874	2,438,001
Martin	759,092	794,797	816,773	850,234	761,598	822,202
Miami-Dade	2,790,821	2,693,520	2,717,271	2,716,488	2,522,774	2,845,840
Monroe	1,251,286	1,297,379	1,318,781	1,330,265	1,240,533	1,285,373
Okeechobee	156,510	177,762	183,345	187,710	169,234	184,462
Orange	1,084,877	1,098,176	1,089,276	1,096,721	998,618	1,122,236
Osceola	251,093	271,668	275,390	287,302	268,080	300,770
Palm Beach	1,937,351	2,072,444	2,147,560	2,191,356	1,951,236	2,155,912
Polk	913,815	963,831	994,016	1,026,706	930,702	1,044,573
St. Lucie	361,953	390,074	408,956	428,178	389,668	429,396

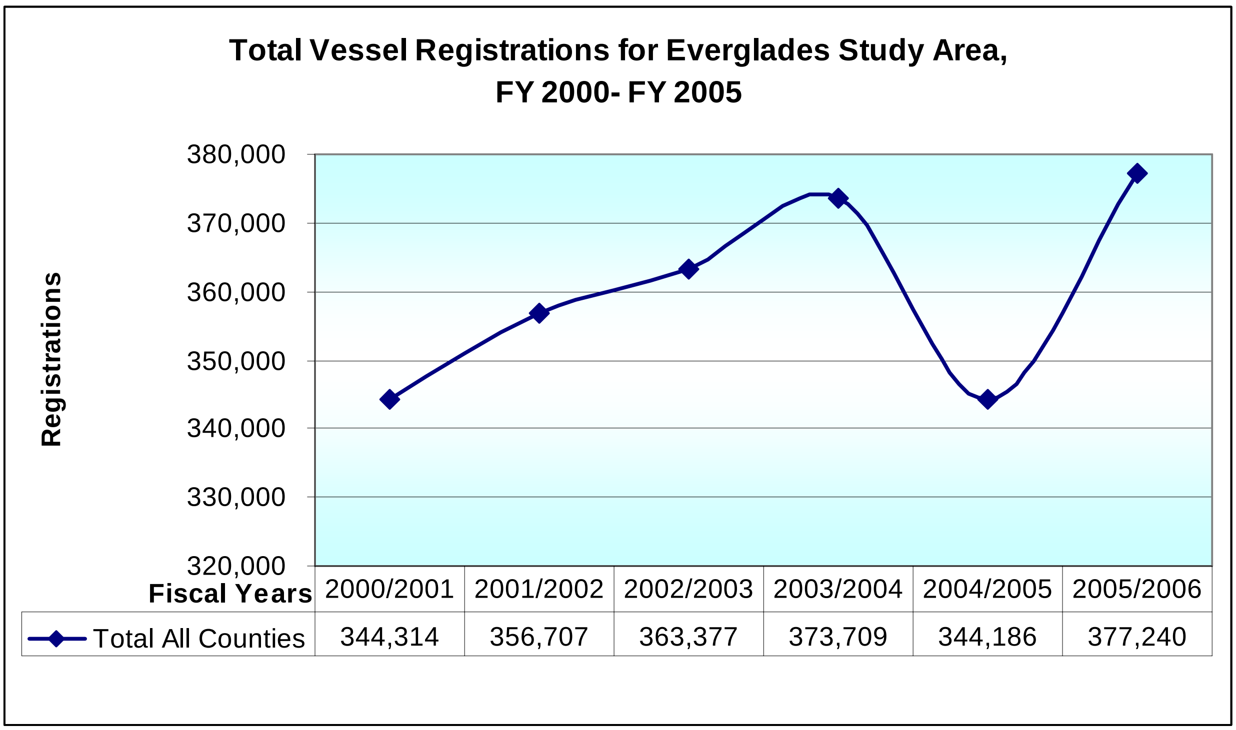
Source: Sidman, C., et al. 2005-2007.

- Miami-Dade, Broward, Lee, and Palm Beach counties had the highest estimated number of boating activity person days from FY2000 to FY2005.[75]
- The number of person days in most counties increased steadily from FY2000 until FY2004, when person days decreased due to a very active hurricane season in 2004.
- Osceola County had the highest percent change, at 20%, in person days from FY2000 to FY2005.

Vessel Registrations for Everglades Study Area

With 10,000 miles of streams and rivers and nearly 8,500 miles of tidal coastline, boating is a popular recreation activity for many Floridians.[76] A total of 842,778 vessels were registered statewide in FY 2005/06.[77] Vessel registrations in the Everglades study area totaled 377,240 in FY 2005/06.[78] This represents 45% of the state total and an increase of 32,926 registrations, or 10%, from FY 2000/01.

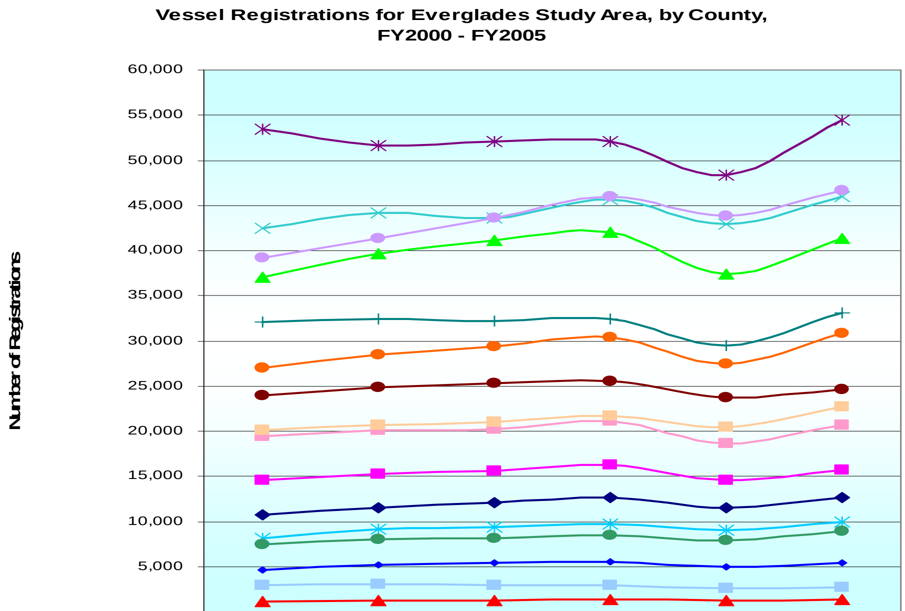
Figure 46.



Source: Department of Highway Safety and Motor Vehicles.

- Total vessels registered in the Everglades study area was 377,240 in FY2005/06, an increase of 32,926 registrations, or 10%, from FY 2000/01.
- Declines in 2004/05 may be due to increased hurricane activity, particularly along the southeast coast.

Figure 47.



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Broward	42,498	44,129	43,664	45,615	42,942	45,939
Charlotte	19,421	20,089	20,170	21,183	18,606	20,634
Collier	20,166	20,701	20,995	21,719	20,451	22,656
Glades	1,091	1,218	1,294	1,344	1,216	1,332
Hendry	2,903	3,026	2,929	2,948	2,577	2,760
Highlands	8,094	9,104	9,404	9,719	9,050	9,961
Lee	39,246	41,316	43,610	45,950	43,829	46,705
Martin	14,542	15,226	15,647	16,288	14,590	15,751
Miami-Dade	53,464	51,600	52,055	52,040	48,329	54,518
Monroe	23,971	24,854	25,264	25,484	23,765	24,624
Okeechobee	4,625	5,253	5,418	5,547	5,001	5,451
Orange	32,059	32,452	32,189	32,409	29,510	33,163
Osceola	7,420	8,028	8,138	8,490	7,922	8,888
Palm Beach	37,114	39,702	41,141	41,980	37,380	41,301
Polk	27,004	28,482	29,374	30,340	27,503	30,868
St. Lucie	10,696	11,527	12,085	12,653	11,515	12,689

Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations were highest in 4 counties (Miami-Dade, Lee, Broward, and Palm Beach), increasing 9% from FY 2000 - FY 2005.
- All counties in the study area, except for one (Hendry County), saw an increase in the number of vessel registrations between FY 2000 - FY 2005.
- The county in the study area with the highest percentage increase of 23% was Highlands County.
- The county in the study area with the highest amount of increase of 7,459 vessels was Lee County.
- Declines in 2004/05 may be due to increased hurricane activity, particularly along the SE coast.

Wildlife Viewing

Overall, 4.2 million people participated in some form of Residential or Nonresidential wildlife viewing in Florida in 2006, ranking the state as second highest in the number of people participating in wildlife-viewing recreation.[79] "Residential wildlife viewing" includes activities within one mile of an individual's home in Florida, while "Nonresidential wildlife viewing" includes activities located outside a one mile radius of the participants' home. It is important to note that "Nonresidential wildlife viewing" participants include Florida residents and out-of-state visitors. There were 1.6 million wildlife viewers (Florida residents and out-of-state visitors) participating in Non-residential activities in Florida in 2006. Additionally, there were nearly 3.3 million Florida residents participating in Residential activities.

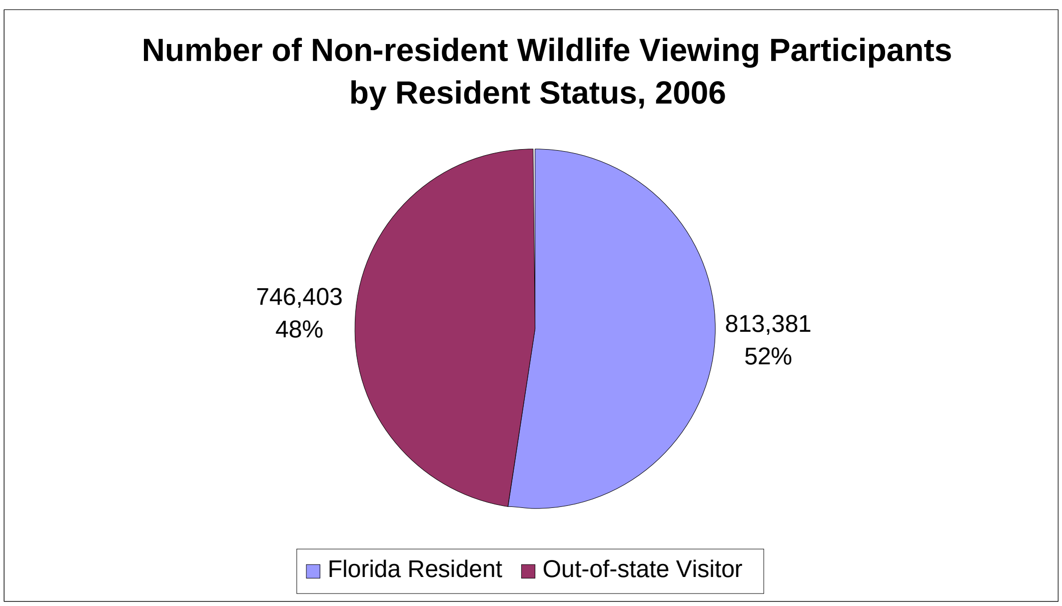
Table 23. Participation in Non-Residential Wildlife Viewing in Florida in 2006 (Participants 16 Years Old And Older)

	Florida Resident	Out-of-state Visitor	Total
Total Number of participants	813,381	746,403	1,559,784
Observing wildlife	618,671	553,210	1,171,880
Photographing wildlife	363,900	451,407	815,307
Feeding wildlife	304,375	133,263	437,638
Number of days	10,449,338	6,101,889	16,551,227
Observing wildlife	9,708,907	4,853,203	14,562,110
Photographing wildlife	4,585,262	2,428,434	7,013,696
Feeding wildlife	5,411,759	446,477	5,858,235
Number of trips	8,184,700	1,487,109	9,671,809

Note: Participants may enjoy multiple activities so totals exceed 100%.
Source: Florida Fish and Wildlife Conservation Commission. (2007). The 2006 Economic Benefits of Wildlife Viewing Recreation in Florida. Table 2 and Table 3. p.3-4.

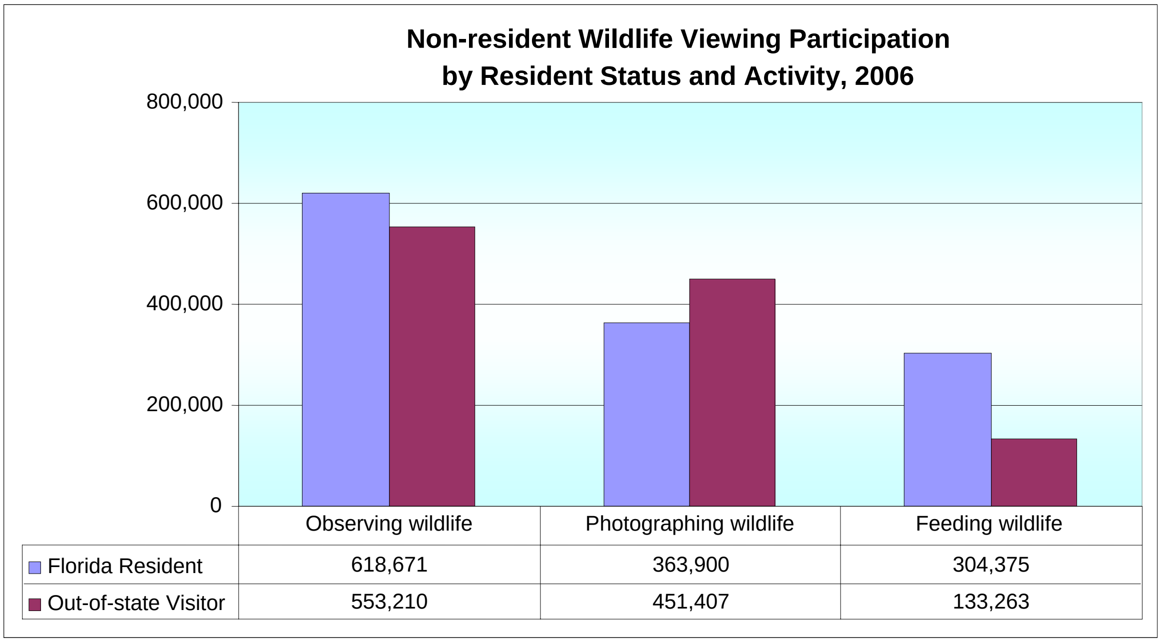
Of the 1,559,784 participants in Non-residential wildlife viewing, more than 50% were Florida residents. The most popular Nonresidential activity was observing wildlife. For Non-residential wildlife viewing, 40% were Florida residents observing wildlife, 23% were Florida residents photographing wildlife, and 20% were Florida residents feeding wildlife. Also, 35% were out-of-state visitors observing wildlife, 29% were visitors photographing wildlife, and 9% were visitors feeding wildlife.[80] Florida residents spent more than 9.9 million days participating in Nonresidential activities, more than 60% of the total. Likewise, Florida residents made over 8.2 million trips for Nonresidential activities, about 85% of the total. Finally, most of the Non-residential wildlife viewing occurred on public land for both Florida residents and out-of-state visitors.

Figure 48.



Source: Florida Fish and Wildlife Conservation Commission. (2007).

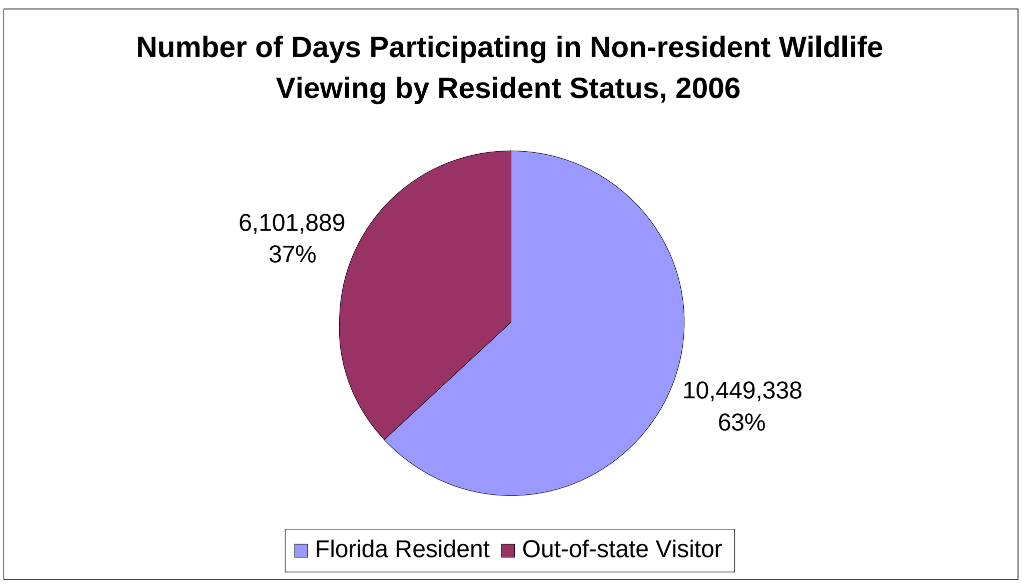
Figure 49.



	Observing wildlife	Photographing wildlife	Feeding wildlife
Florida Resident	618,671	363,900	304,375
Out-of-state Visitor	553,210	451,407	133,263

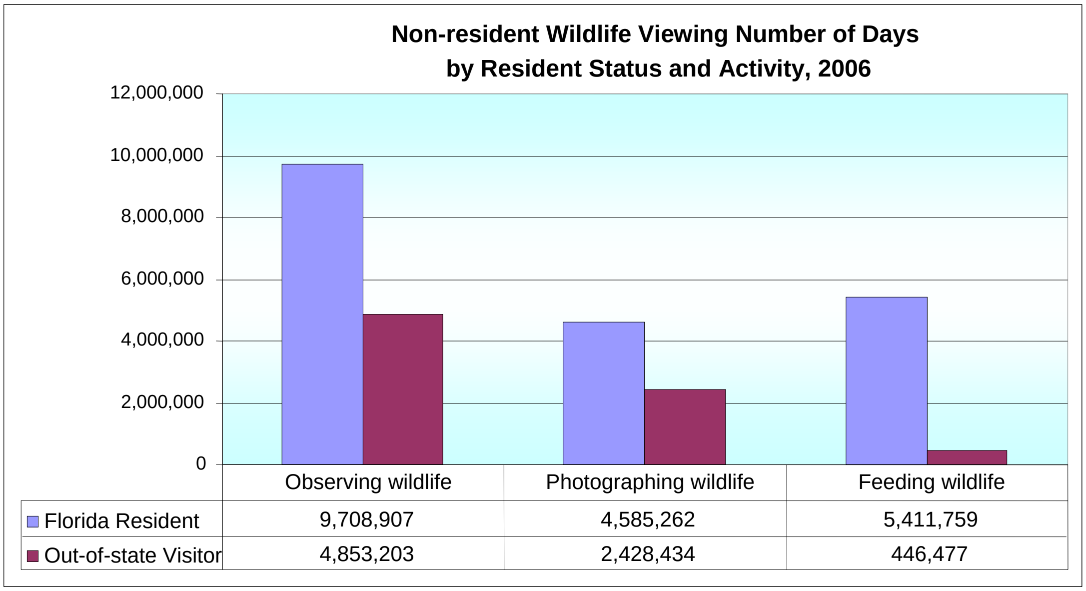
Source: Florida Fish and Wildlife Conservation Commission. (2007).

Figure 50.



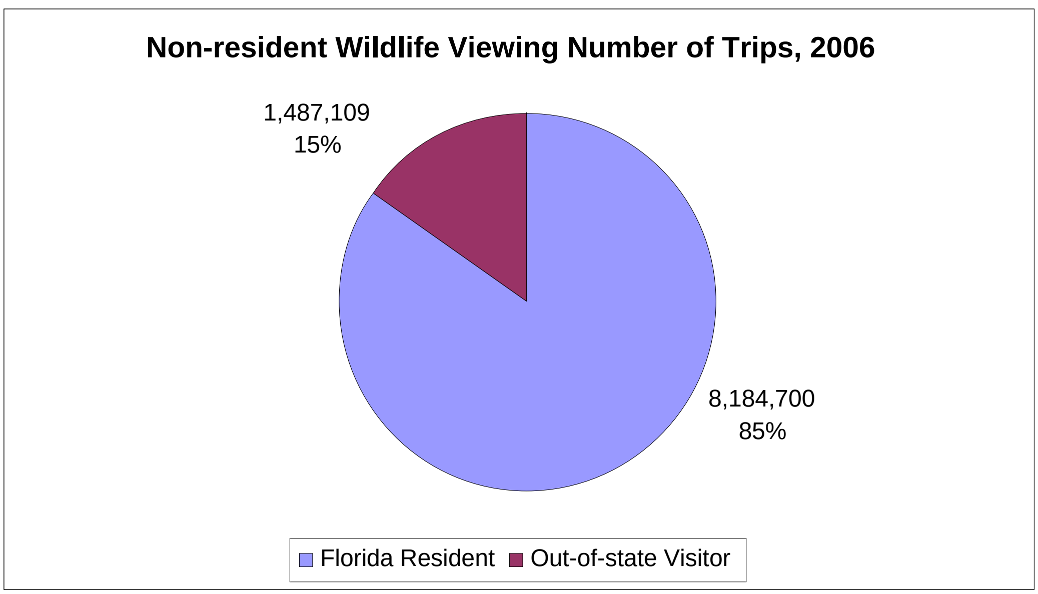
Source: Florida Fish and Wildlife Conservation Commission. (2007).

Figure 51.



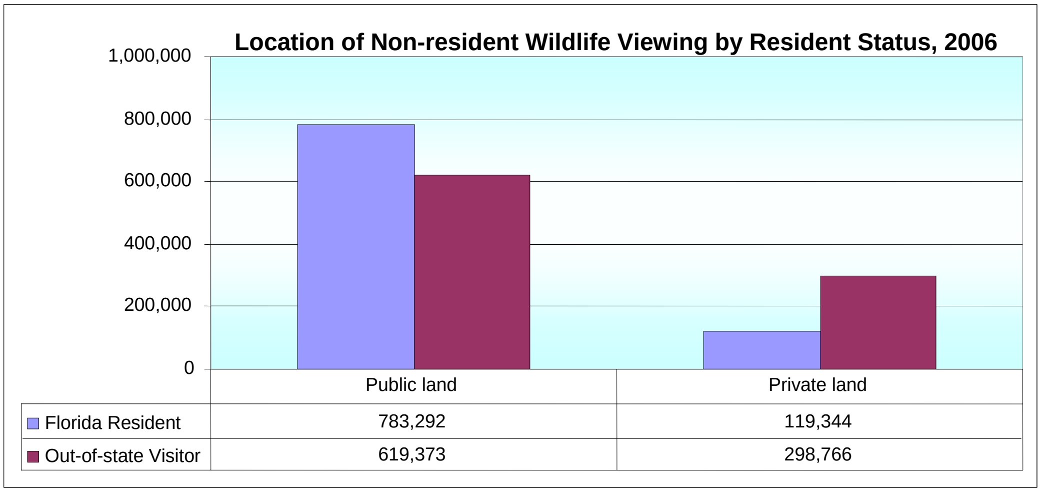
Source: Florida Fish and Wildlife Conservation Commission. (2007).

Figure 52.



Source: Florida Fish and Wildlife Conservation Commission. (2007).

Figure 53.



Source: Florida Fish and Wildlife Conservation Commission. (2007).

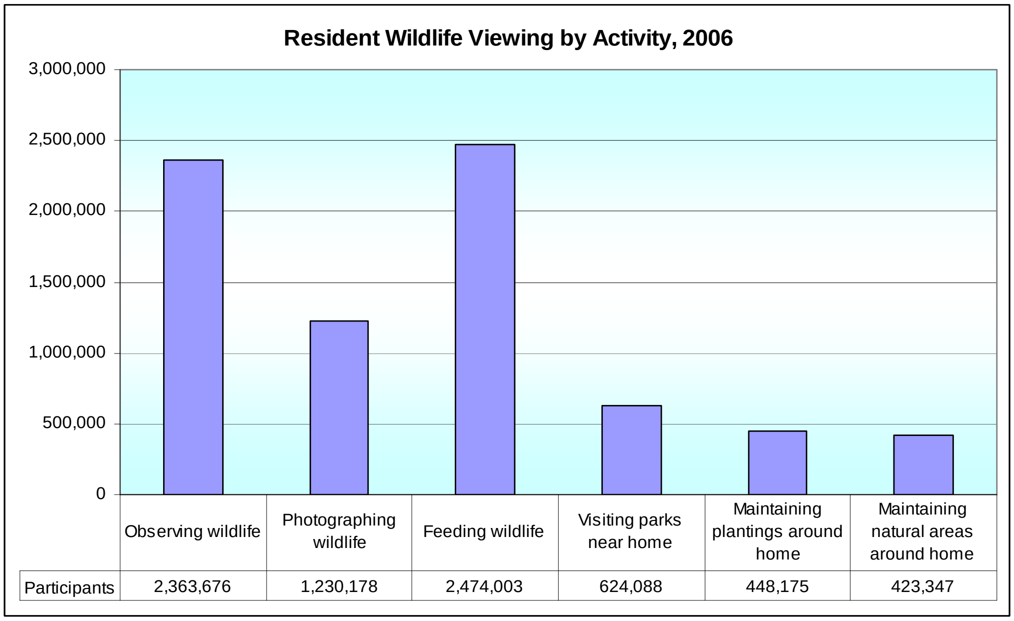
Feeding birds and wildlife was the most popular Residential wildlife viewing activity. Of the total 3.3 million participants, 72% observed wildlife, 38% photographed wildlife, 76% fed wildlife, 19% visited parks near their homes, 14% maintained plantings around their homes, and 13% maintained natural areas around their homes.[81] A total of 282 million days were spent participating in Residential wildlife viewing, of which 87% involved observing wildlife and 13% photographing wildlife.

Table 24. Participation in Residential Wildlife Viewing in Florida in 2006 by Florida Residents within One Mile of Home (Participants 16 Years Old and Older)

Number of participants	**3,273,861**
Feeding birds and wildlife	2,474,003
Observing wildlife	2,363,676
Photographing wildlife	1,230,178
Visiting parks near home	624,088
Maintaining plantings around home	448,175
Maintaining natural areas around home	423,347
Number of days	
Observing wildlife	245,609,606
Photographing wildlife	36,212,590

Note: Participants may enjoy multiple activities so totals exceed 100%.
Source: Florida Fish and Wildlife Conservation Commission. (2007). The 2006 Economic Benefits of Wildlife Viewing Recreation in Florida. Table 4. p.5.

Figure 54.



Source: Florida Fish and Wildlife Conservation Commission. (2007).

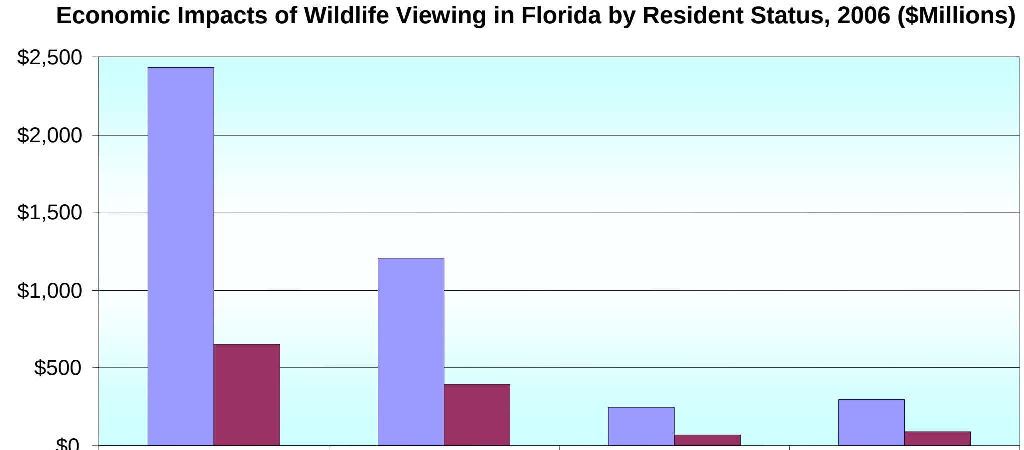
The total retail sales from 2006 wildlife viewing in Florida were estimated at $3.1 billion ($2.4 billion by residents and $653.3 million by nonresidents). Since 2001, expenditures in Florida for wildlife viewing have almost doubled ($1.575 billion in 2001). These numbers show a reversal from the previous five-year period in which expenditures had decreased slightly ($1.677 billion in 1996). These 2006 expenditures support a total economic effect to the Florida economy of $5.248 billion.

Table 25. Economic Impacts of Wildlife Viewing in Florida, 2006

	Florida Resident	Out-of-state Visitor	Total
Retail sales	$2.428 billion	$653.3 million	$3.081 billion
Salaries & wages	$1.204 billion	$391.8 million	$1.595 billion
Full & part-time jobs	38,069	13,298	51,367
Tax revenues:			
State sales tax	$243.1 million	$69.7 million	$312.8 million
Federal income tax	$292.5 million	$92.8 million	$385.3 million
Total economic effect	$4.078 billion	$1.170 billion	$5.248 billion

Source: Florida Fish and Wildlife Conservation Commission. (2007). The 2006 Economic Benefits of Wildlife Viewing Recreation in Florida. Table E-1. p.V.

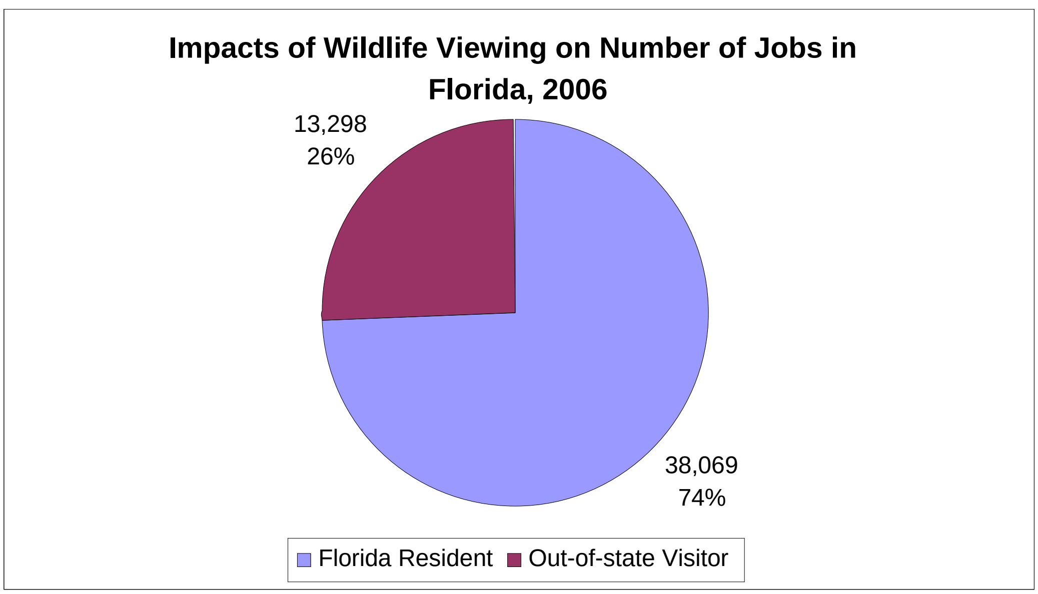
Figure 55.



	Retail sales	Salaries & wages	State sales tax revenue	Federal income tax revenue
Florida Resident	$2,428,000,000	$1,204,000,000	$243,100,000	$292,500,000
Out-of-state Visitor	$653,300,000	$391,800,000	$69,700,000	$92,800,000

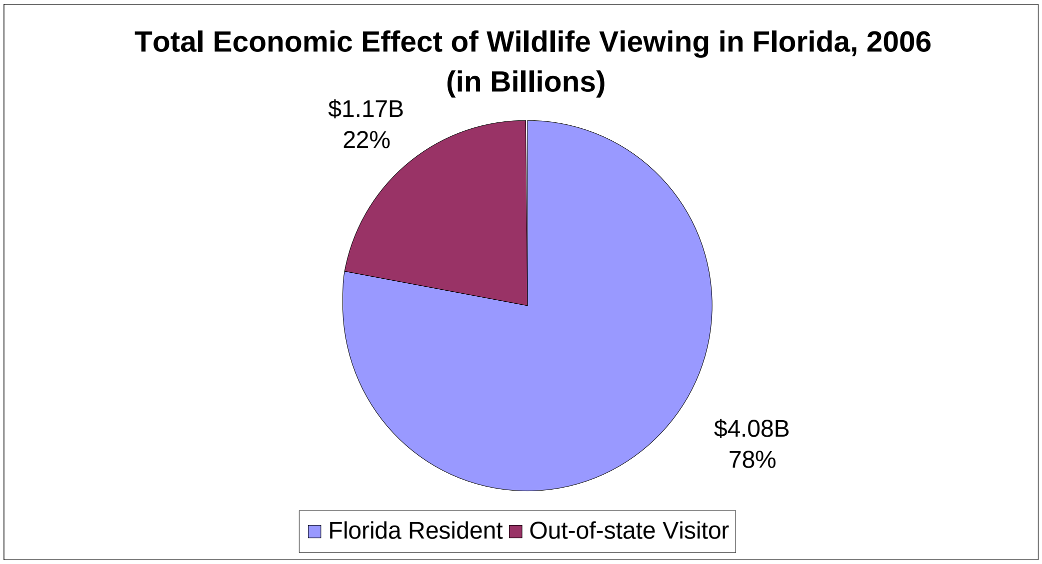
Source: Florida Fish and Wildlife Conservation Commission. (2007).

Figure 56.



Source: Florida Fish and Wildlife Conservation Commission. (2007).

Figure 57.



Source: Florida Fish and Wildlife Conservation Commission. (2007).

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VII. APPENDICES

APPENDIX A – WATERSHED LITERATURE REVIEW

APPENDIX B – 16 COUNTY DATA CHARTS

APPENDIX A – ECONOMIC VALUE: EVERGLADES WATERSHED

PROPOSED CONCEPTUAL APPROACHES

Values Measurable by Market Transactions

The Everglades Watershed contains multiple aquatic environments: rivers, lakes and a unique wetland. These are diverse recreation settings allowing for a variety of tourism and recreation activities.

1. Recreation

    a. Tourism and Sightseeing Attendance

        Number of Local, State and Federal Parks, Wildlife Preserves, etc and Visitors

        Private Attractions, possible those owned by Native Americans

    b. Recreation Activities

        Fishing, Hunting and Trapping

        Wildlife Viewing

        Tours

        Boating Services (do air boats require a license similar to boats?)

        Camping

    c. Recreation Support Services

        Hotel/Motel Units

        Public and Private Camp Grounds

        Tour operators and number of excursions (could be side trips of larger trips)

        Hunting and Fishing Guide Services plus retail activity such as bait and tackle Marinas, plus maintenance, sales and services

Possible sources of data that may not have been explored: NETS, National Establishment Time Series database, a 19 year history with longitude and latitude of all businesses with a DUNS number. Captures many small business enterprises not captured in other databases. Includes a number of employees, sales, any parent company information as appropriate, etc.

American Business database, no time series, but is updated every six months based on telephone numbers. Includes an estimate of employment and sales.

Neither would capture business using the area, such a tour operators whose actual business is located outside the watershed. Could possibly do a phone survey of Chambers of Commerce/Convention and Visitor Bureaus who are likely to maintain information on who operates tours in the region.

Corp of Engineers reports do include recreation values, most typically in a standard input-output form.

Ways of measuring the value include:

Economic Impact such as via IMPLAN

Number of Businesses and Total Employment dependent on the watershed, a snap shot in time.

Note, one can argue that putting 187,000 acres back into wetlands service will increase both the quantity of wetland services and the quality of wetlands services, so current values will under-estimate expected future value.

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2. Real Estate Value

Within the watershed, as noted above, there are multiple aquatic environments. Proximity of a property to different environments within the watershed may be a means of valuing the consumption/use value of the different environments. Some papers look at this effect.

However, perhaps a bigger question is what happens to the value of real estate throughout the watershed when there is a significant improvement in an important component of the watershed. Again, putting 187,000 acres back into wetland services is likely to increase both the quantity of other land uses and the quality of the services derived from the land uses.

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3. Risk Avoidance and Reduction of Risk

Particularly since hurricane Katrina there has been a significant amount of discussion about the importance of wetlands as storage areas for excess water and for buffer protection against storm surges. The effectiveness of wetlands in performing these protection services depends on the functional integrity of the wetlands. Restoration of 187,000 acres should improve the functional integrity of the Everglades system and lower the risk and/or reduced any cost associated with flooding. Probably covered in engineering costs benefit analysis of the proposed restoration.

Risk reduction services include:

a. mitigation of pollution (note there was recently a discussion of this in that when they were drawing down Lake Okeechobee in preparation for a hurricane, it was noted that there would likely be a substantial impact on marine environments due to agricultural pollutants that are release more slowly under normal water management.)

b. impoundment of stormwaters, the storage of water for slower release, protects non-wetlands properties from flood damages and/or lowers the total costs of damages that do occur.

Cost Avoidance

a. wetlands also function to clean water of pollutants, thus reducing the cost of water purification for drinking water

b. impoundment of water lowers the cost of drought management

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3. Social Valuation Estimates

Ronald Coase in *"The Problem of Social Cost,"* J. L. & Econ. 1 (1960) suggests that in a legal dispute over the relative rights of property owners, instead of talking about rights it is more productive to view the dispute as one of relative harms. For example, in the case of the *Fountainbleau Hotel Corp. v. Forty-Five Twenty-Five, Inc*. (Fla. App. 1959), the courts determined that the Fountainbleau Hotel had the 'right' to build an addition to their existing building even if it meant that the neighboring hotel, the Eden Roc, suffered the loss of sun on its property. However, Coase argues that if one views each as imposing harm on the other, the question becomes one of who is willing to pay the most to avoid the harm caused. The standard classroom exercise shows that if Fountainbleau would make $1,000,000 from the development, and the Eden Roc would lose $1,100,000, the Eden Roc could pay the Fountainbleau its expected $1,000,000 and still have surplus value. In short the assignment of a legal 'right' does not determine the ultimate allocation of the resource, but it does determine the distribution of wealth.

For more complex situations, such as the Everglades Watershed, where there are many parties with different assessments of the costs and benefits, direct solution are difficult to obtain, so one measure of the value collectively placed on the 'right' to watershed services would be the extent to which the people of Florida as represented by the State of Florida are willing to pay to establish/clarify the right. One measure of this is how much Florida has been willing to pay to assert protection of its right to the flows on in the Flint River watershed. This is a Florida only value, so it may most closely reflect the social value that offsets the loss to the Florida economy when the 187,000 acres is taken out of use for agriculture.

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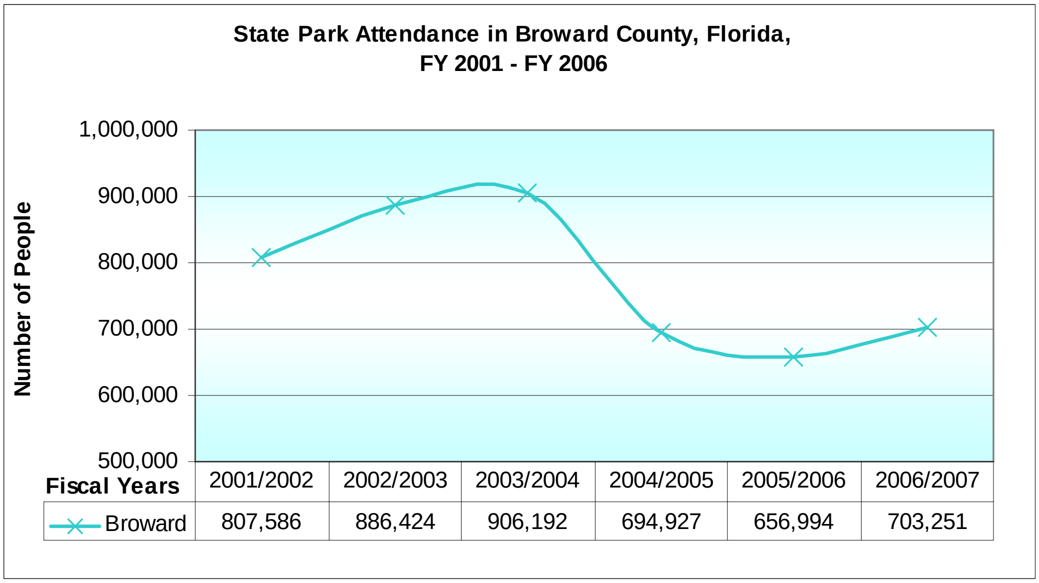
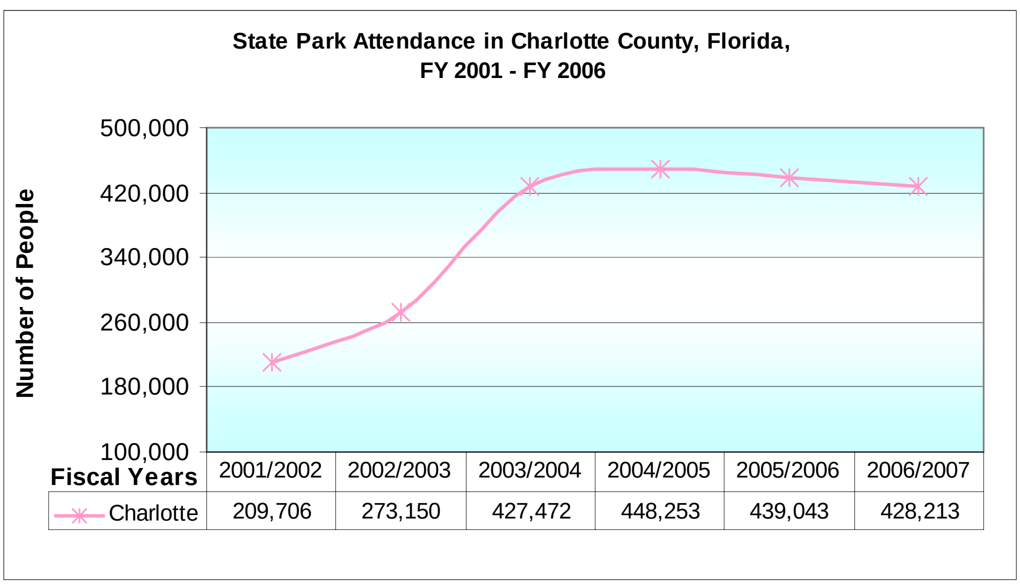
APPENDIX B – 16 COUNTY DATA CHARTS

STATE PARK USAGE FOR EVERGLADES STUDY AREA



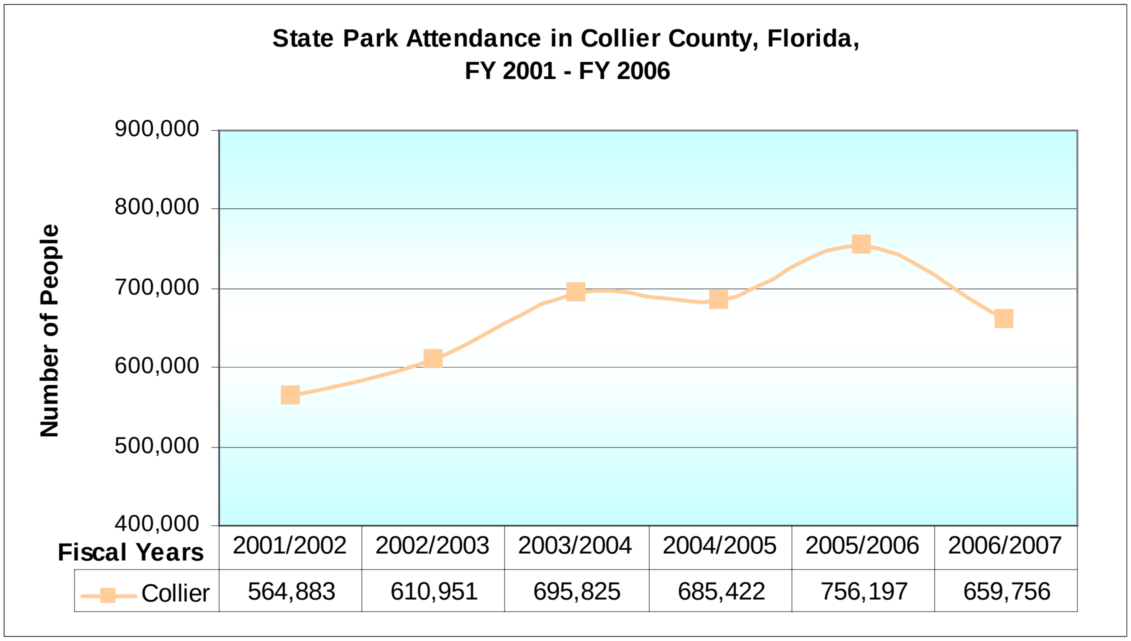
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Broward County decreased by 104,335, or 13%, between FY 2001 - FY 2006.



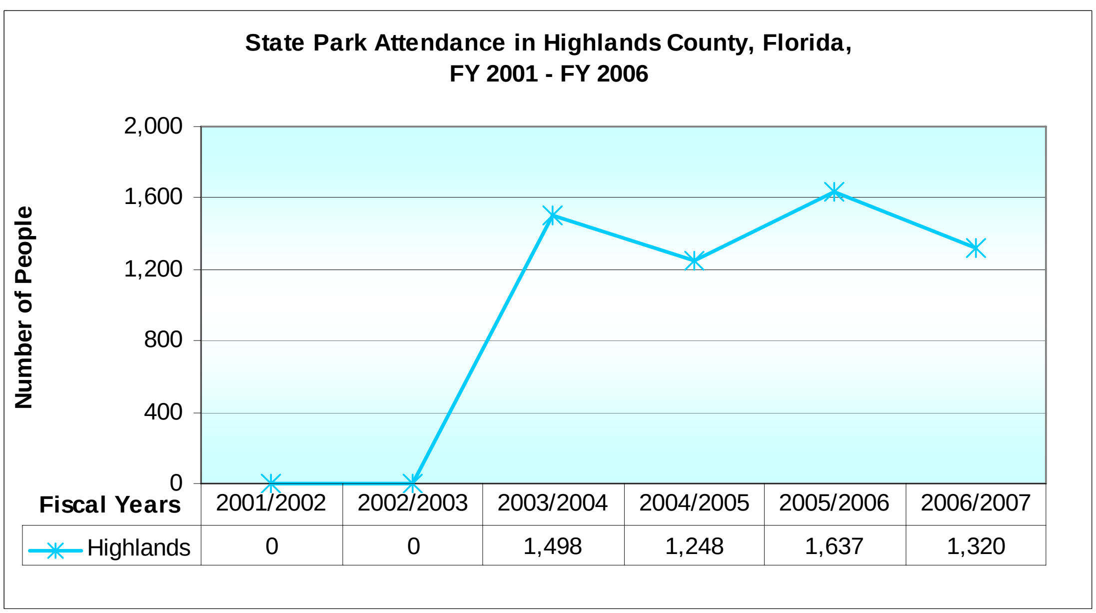
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Charlotte County increased by 218,507, or 104%, between FY 2001 - FY 2006.



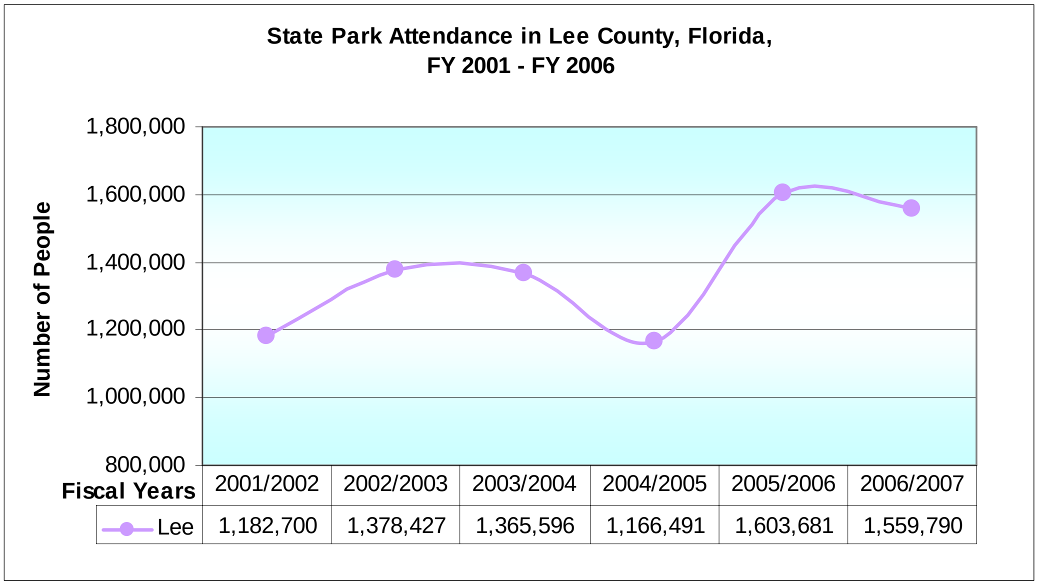
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Collier County increased by 94,873, or 17%, between FY 2001 - FY 2006.



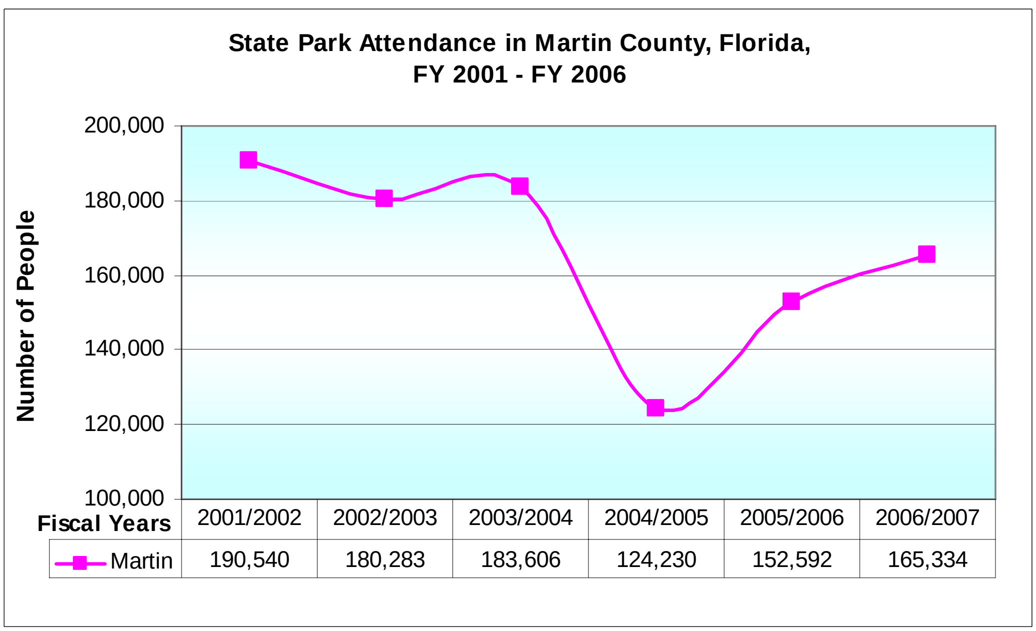
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007
*There were no state parks in Highlands County in FYs 2001 and 2002.

- Park attendance in Highlands County decreased by 178, or 13%, between FY 2003 - FY 2006. (There were no state parks in Highlands County prior to FY 2003.)



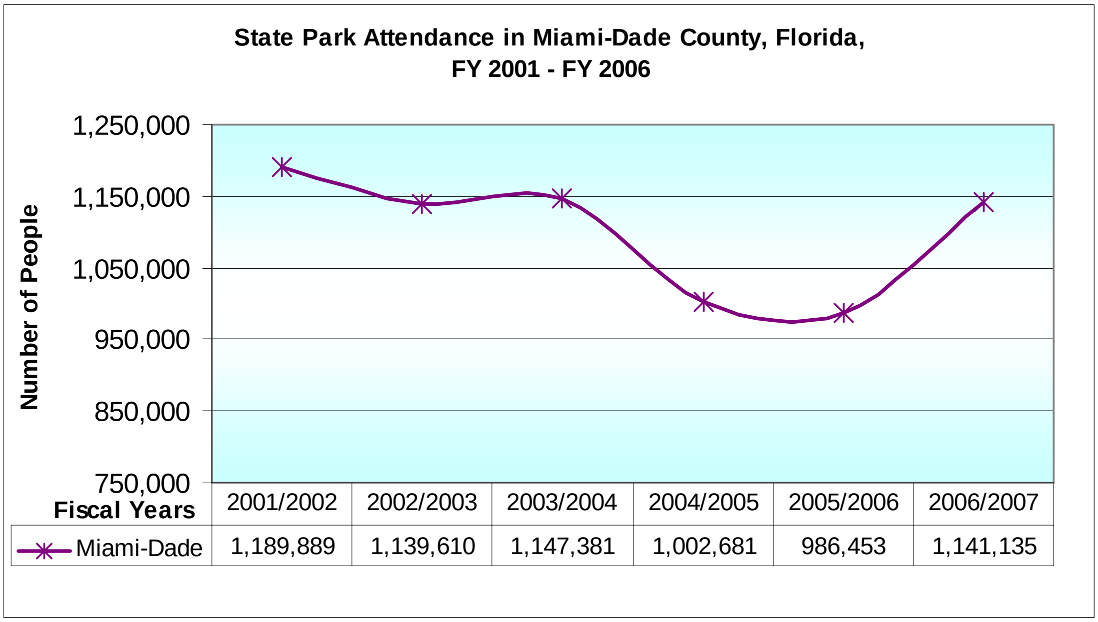
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Lee County increased by 377,090, or 32%, between FY 2001 - FY 2006.



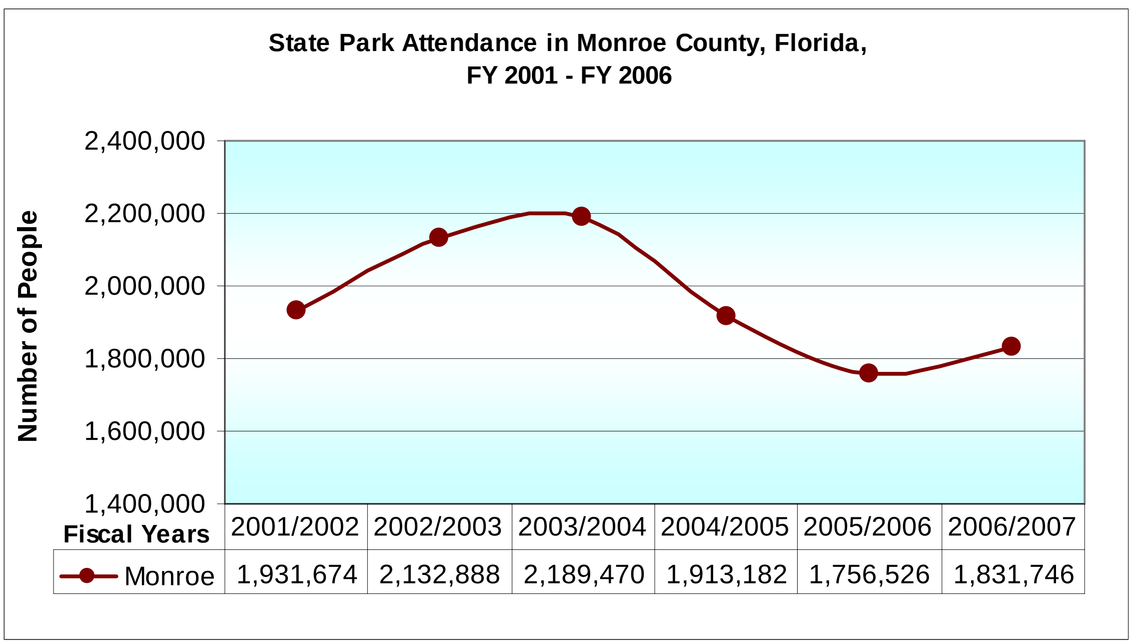
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Martin County decreased by 25,206, or 13%, between FY 2001 - FY 2006.



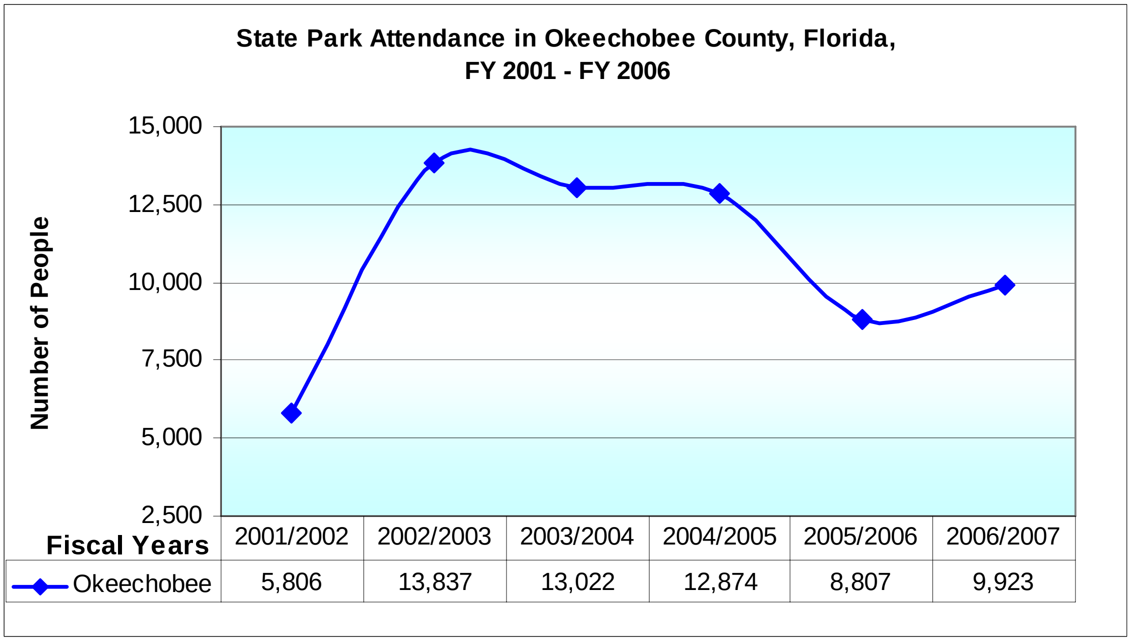
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Miami-Dade County decreased by 48,754, or 4%, between FY 2001 - FY 2006.



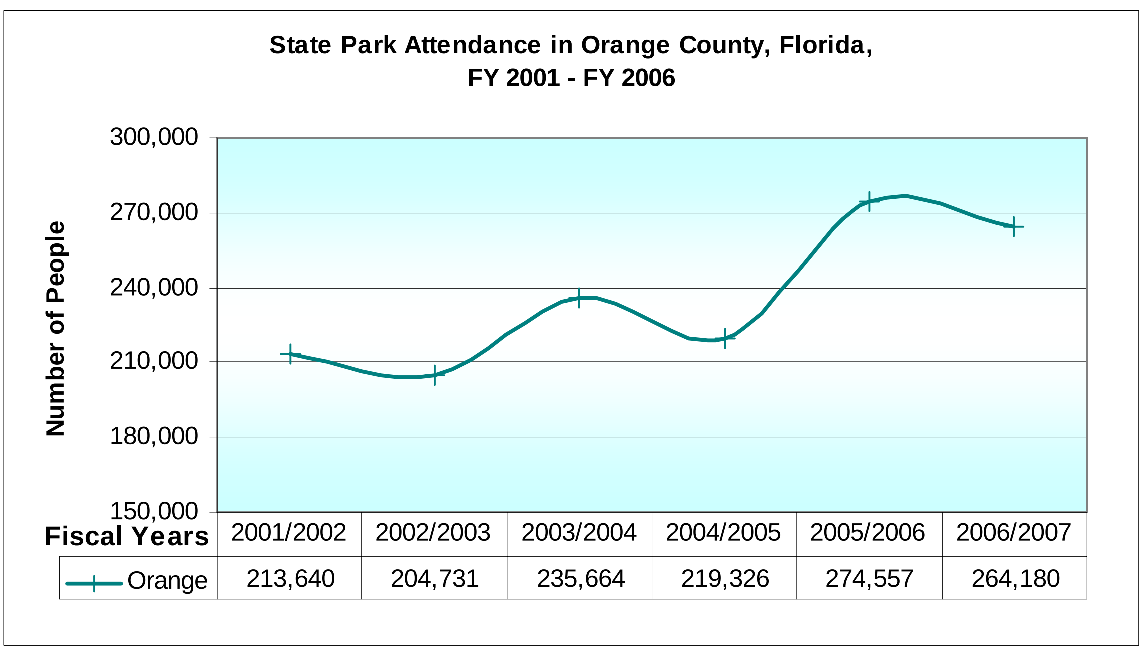
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Monroe County decreased by 99,928, or 5%, between FY 2001 - FY 2006.



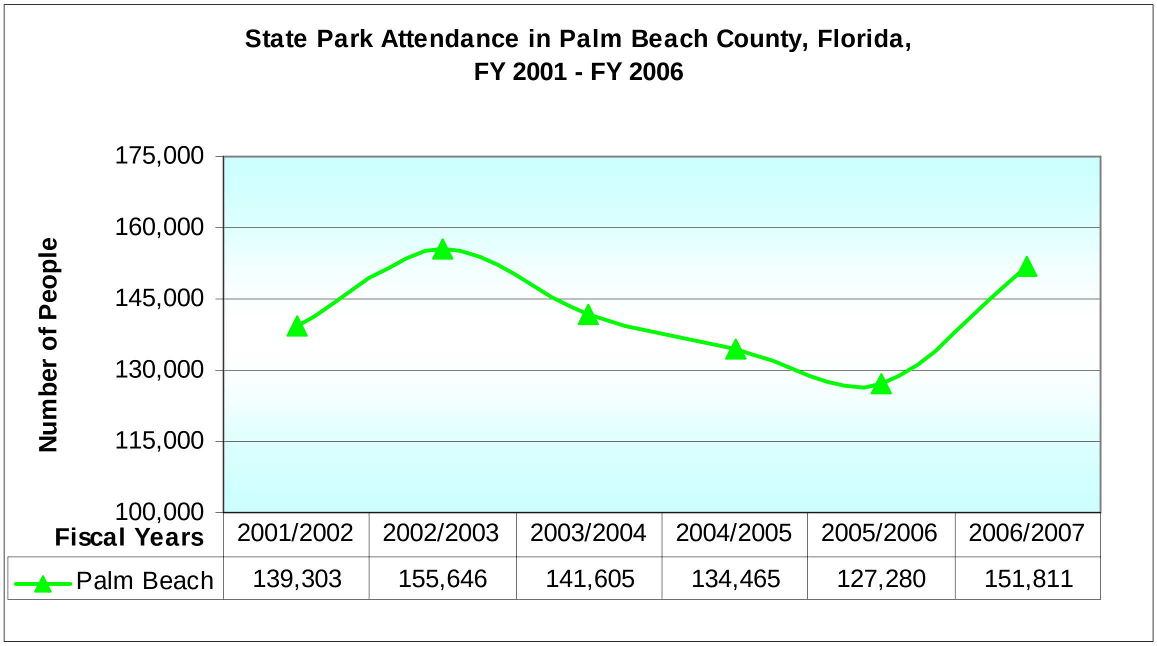
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in Okeechobee County increased by 4,117, or 71%, between FY 2001 - FY 2006.



Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

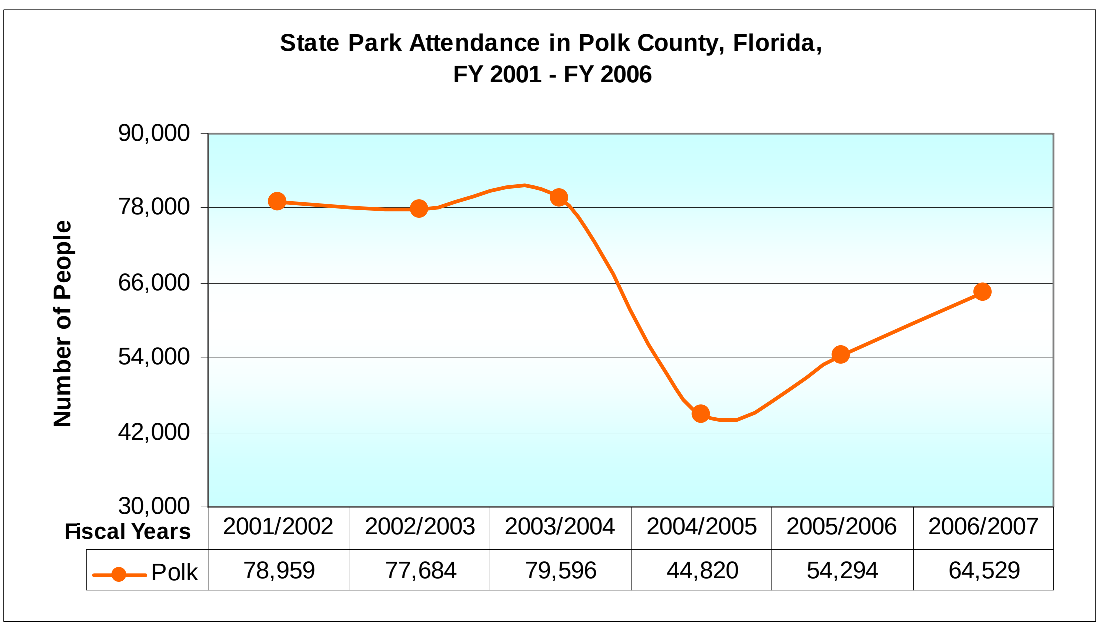
- Park attendance in Orange County increased by 50,540, or 24%, between FY 2001 - FY 2006.



Fiscal Years	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007
Palm Beach	139,303	155,646	141,605	134,465	127,280	151,811

Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

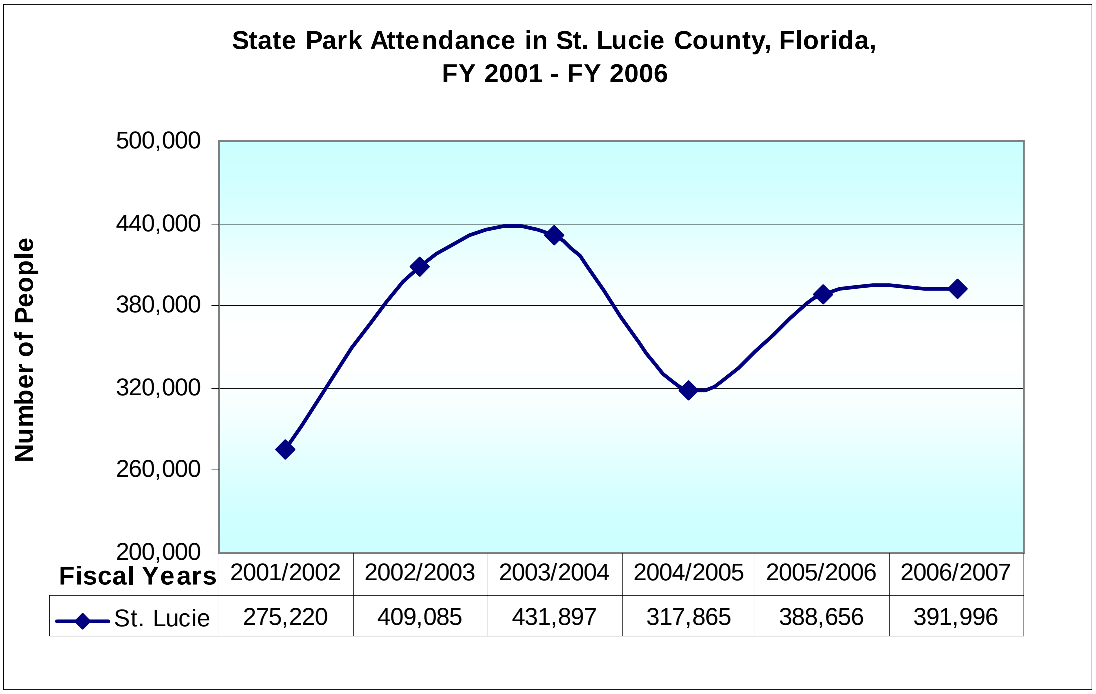
- Park attendance in Palm Beach County increased by 12,508, or 9%, between FY 2001 - FY 2006.



Fiscal Years	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007
Polk	78,959	77,684	79,596	44,820	54,294	64,529

Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

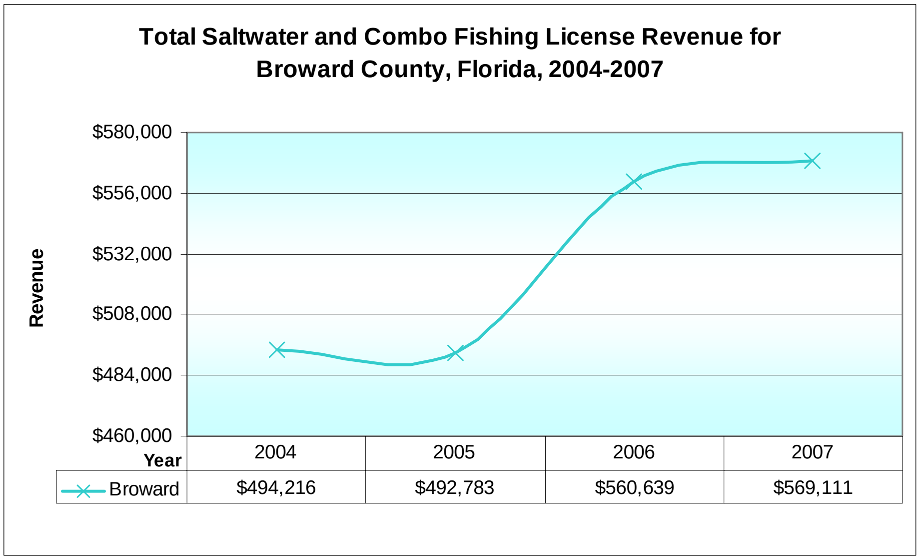
- Park attendance in Polk County decreased by 14,430, or 18%, between FY 2001 - FY 2006.



Fiscal Years	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	2006/2007
St. Lucie	275,220	409,085	431,897	317,865	388,656	391,996

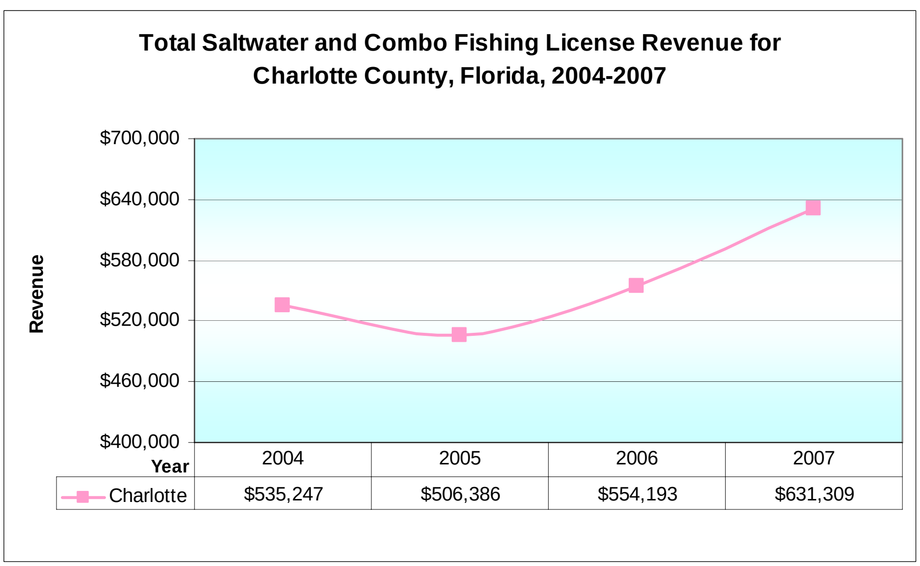
Source: Florida Statistical Abstracts, T. 19.52, 2001-2007

- Park attendance in St. Lucie County increased a total of 116,776, or 42%, between FY 2001 - FY 2007.



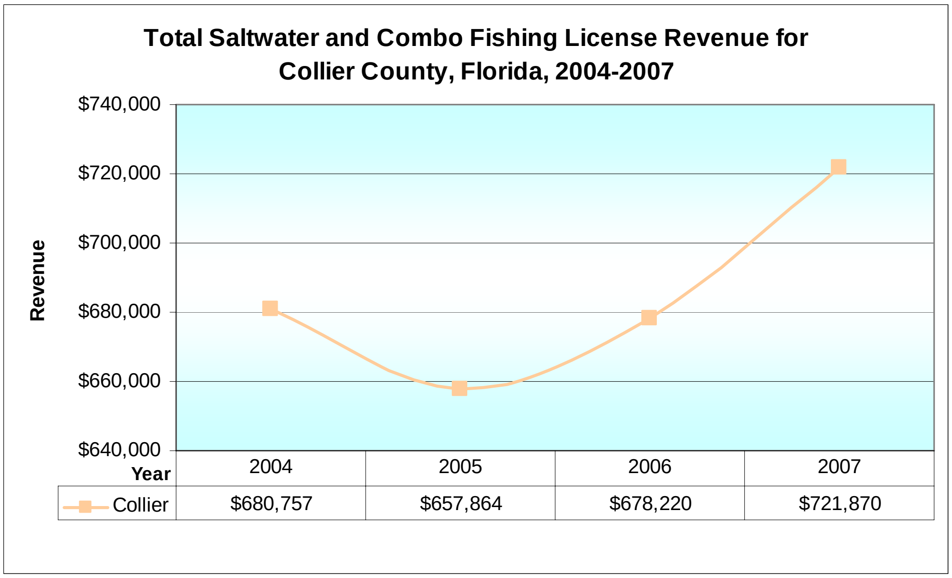
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Broward County saltwater and combo fishing license revenue increased by $74,895, or 15%, from 2004-2007.



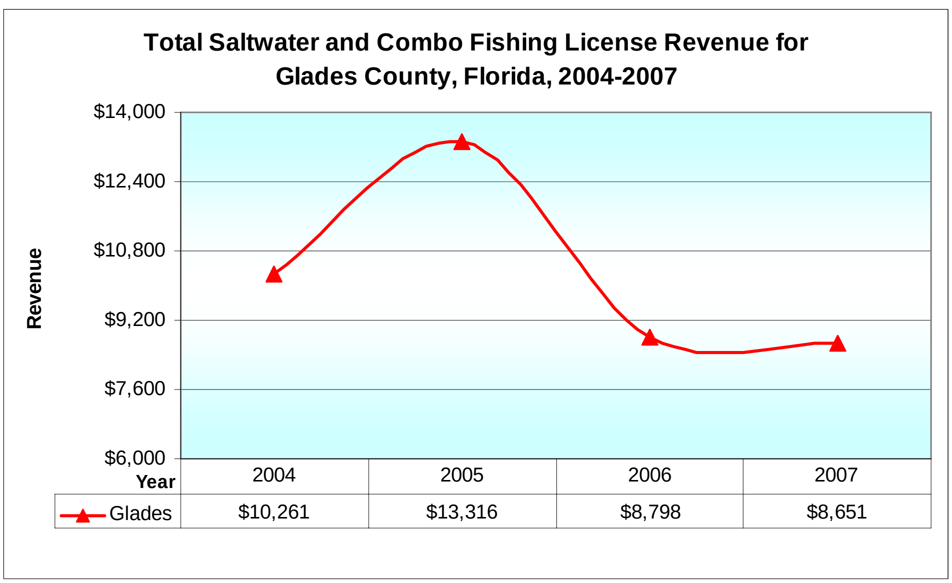
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Charlotte County saltwater and combo fishing license revenue increased by $96,062, or 18%, from 2004-2007.



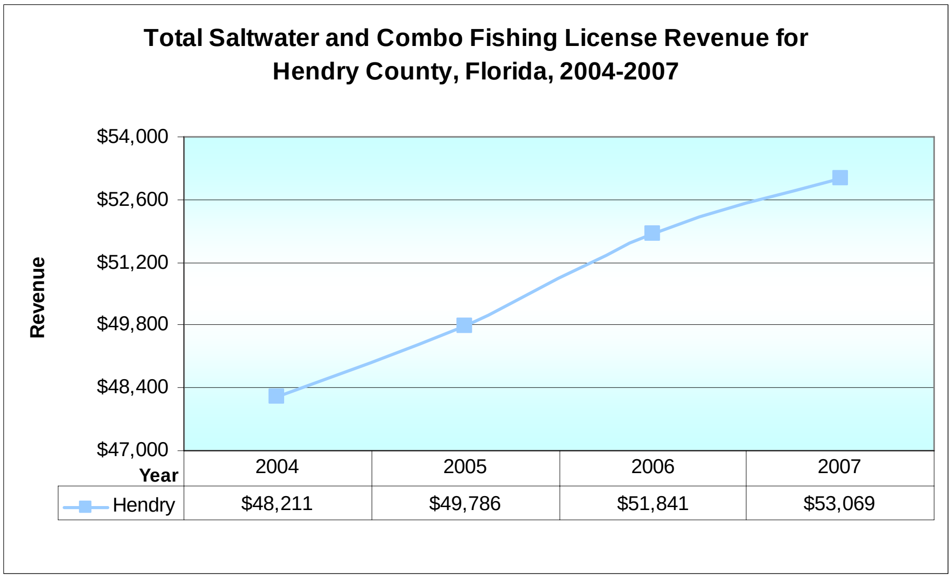
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Collier County saltwater and combo fishing license revenue increased by $41,113, or 6%, from 2004-2007.



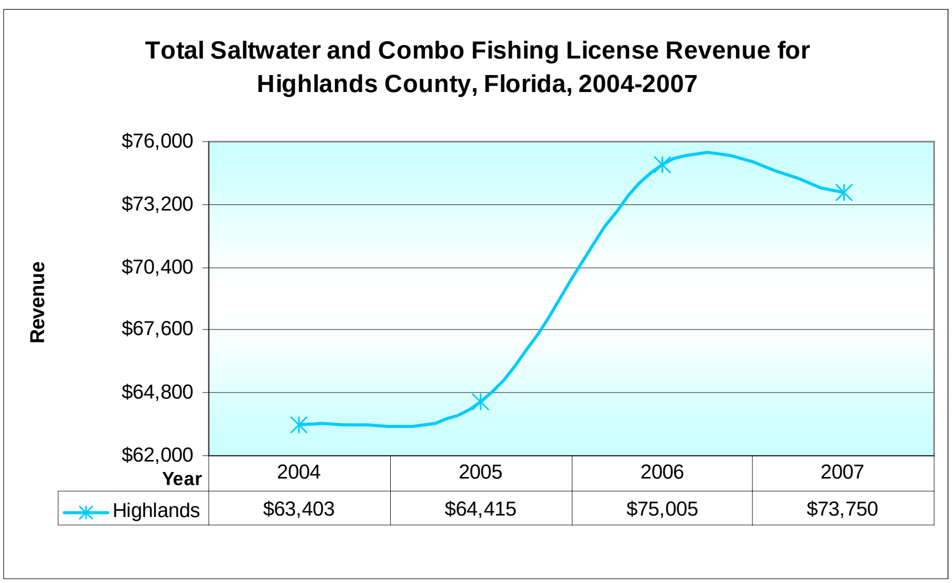
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Glades County saltwater and combo fishing license revenue decreased by $1,610, or 16%, from 2004-2007.



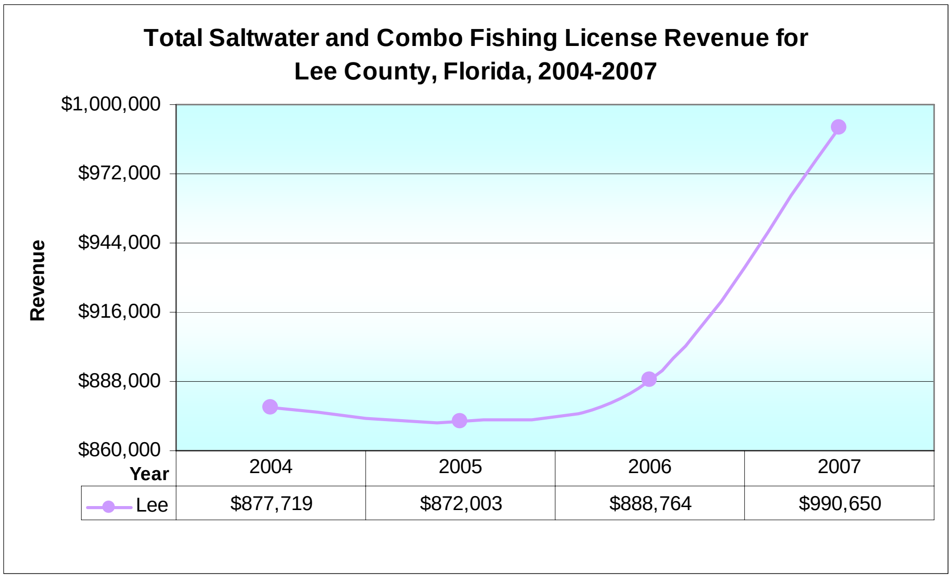
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Hendry County saltwater and combo fishing license revenue increased $4,858, or 10%, from 2004-2007.



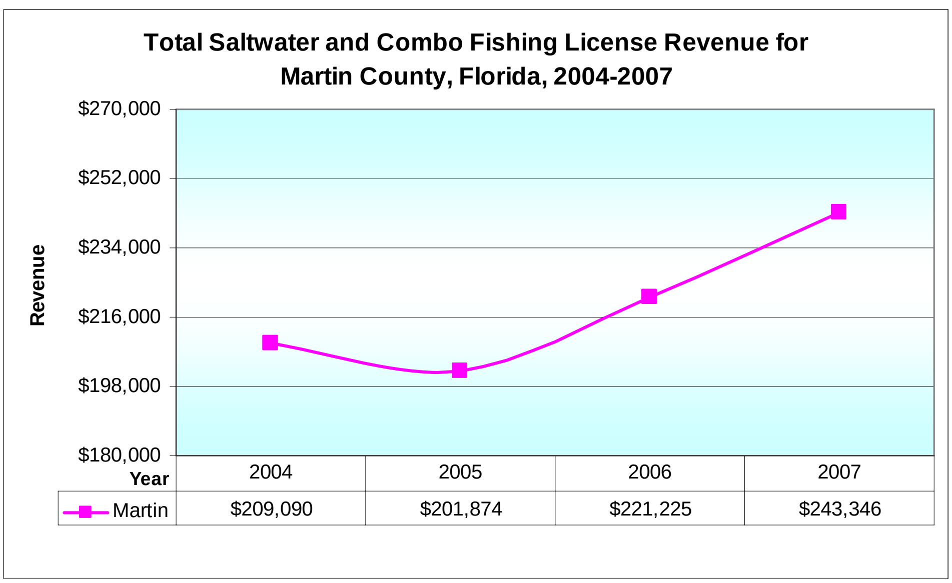
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Highlands County saltwater and combo fishing license revenue increased $10,347, or 16%, from 2004-2007.



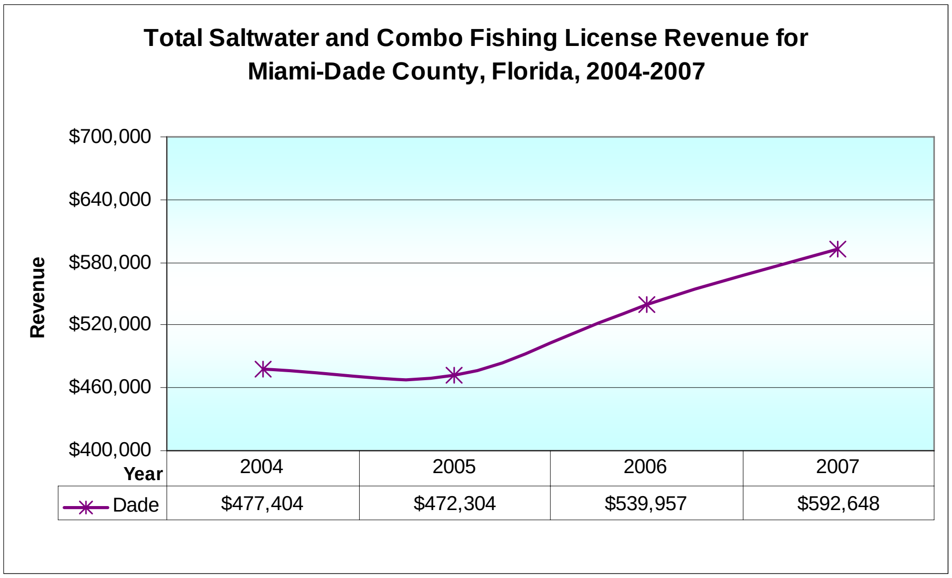
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Lee County saltwater and combo fishing license revenue increased by $112,931, or 13%, from 2004-2007.



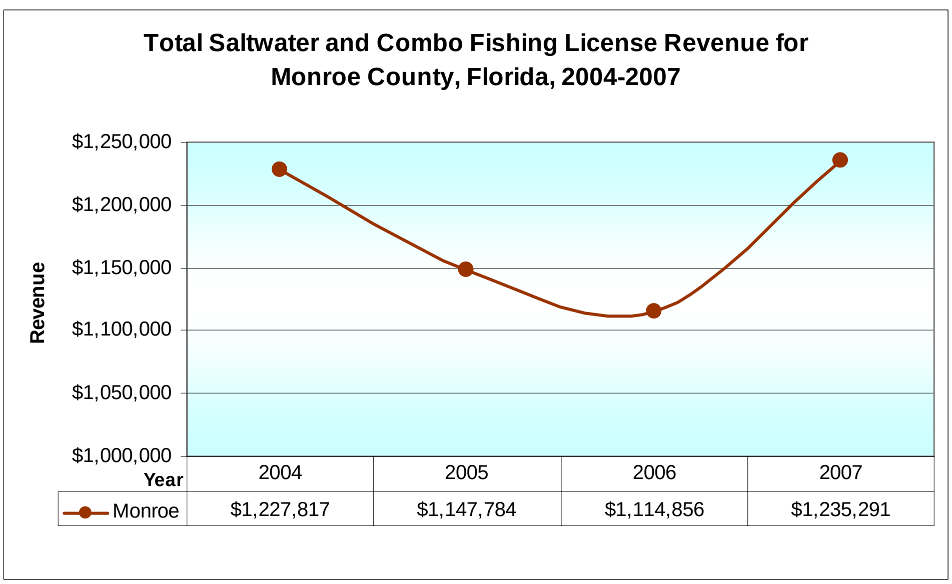
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Martin County saltwater and combo fishing license revenue increased by $34,256, or 16%, from 2004-2007.



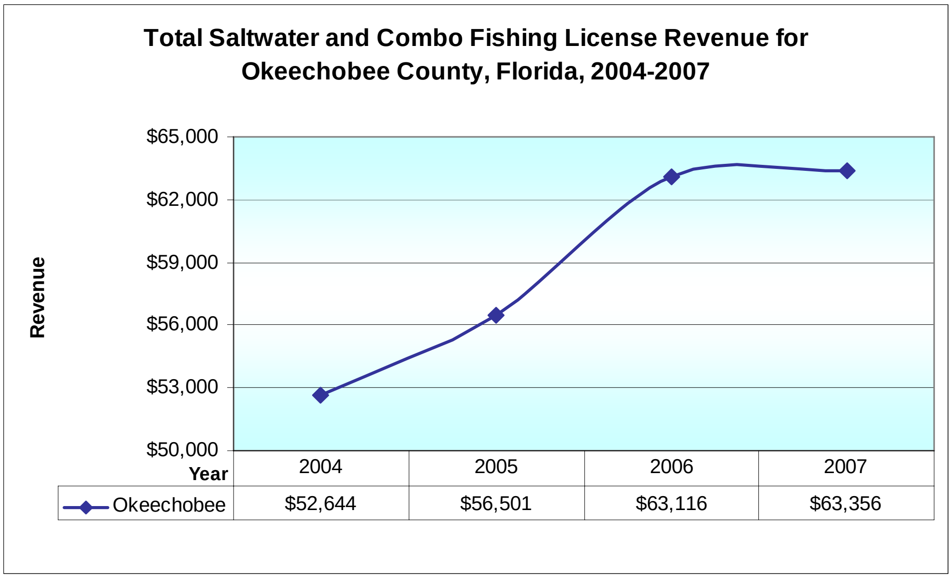
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Miami-Dade County saltwater and combo fishing license revenue increased $115,244, or 25%, from 2004-2007.



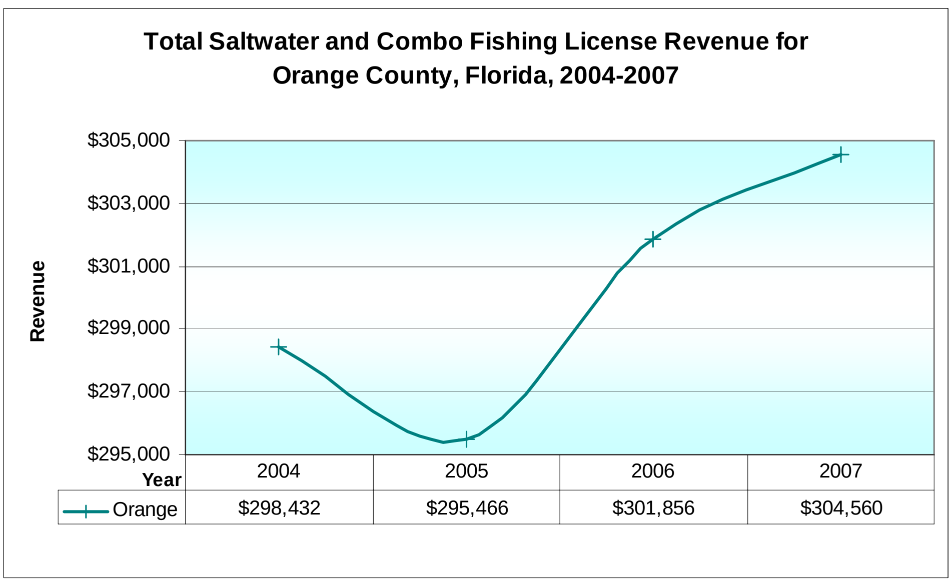
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Monroe County saltwater and combo fishing license revenue decreased $7,474, or 6%, from 2004-2007.



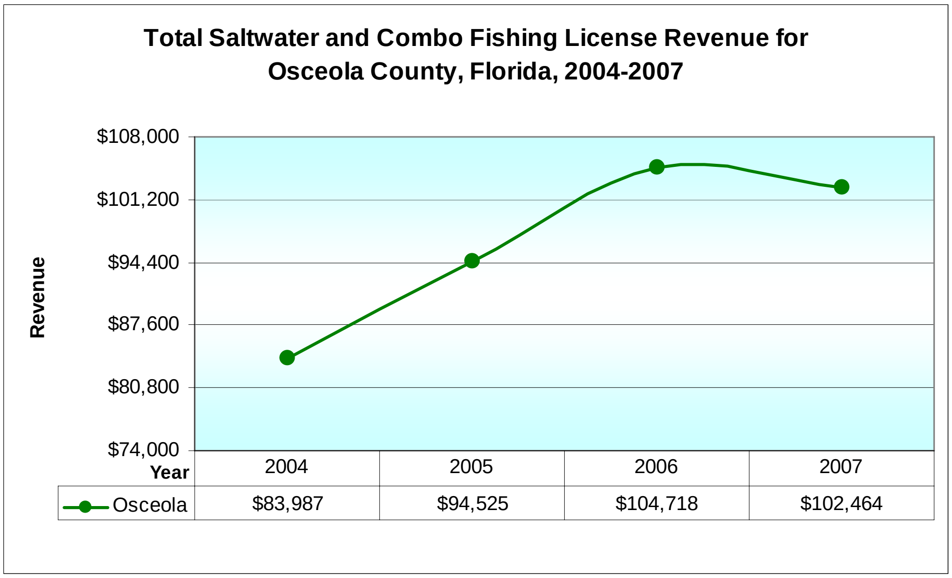
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Okeechobee County saltwater and combo fishing license revenue increased $10,712, or 20%, from 2004-2007.



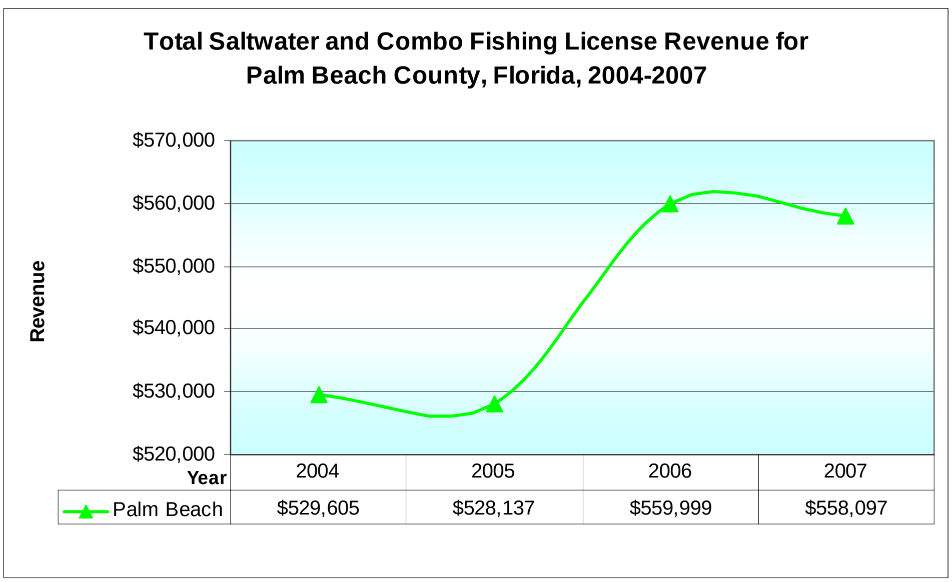
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Orange County saltwater and combo fishing license revenue increased $6,128, or 2%, from 2004-2007.



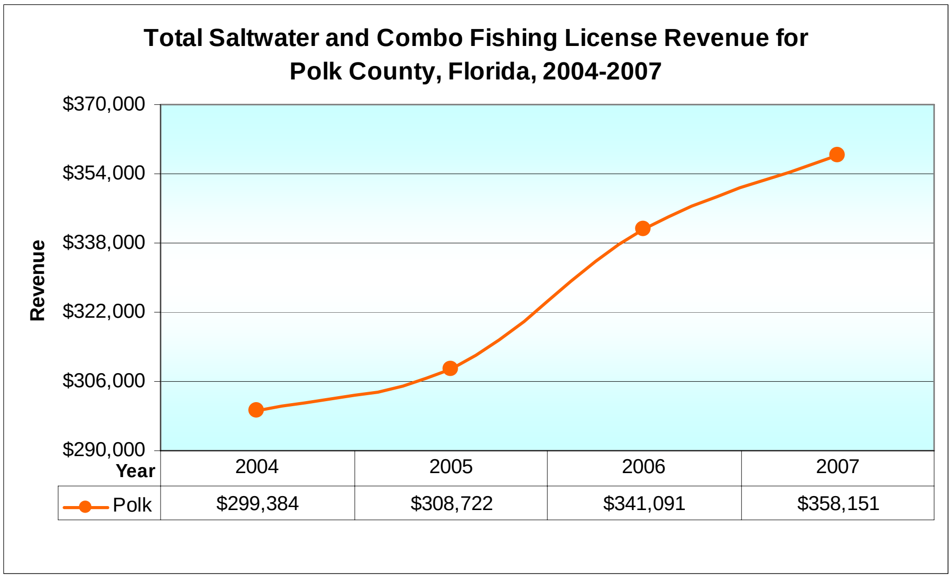
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Osceola County saltwater and combo fishing license revenue increased $18,477, or 22%, from 2004-2007.



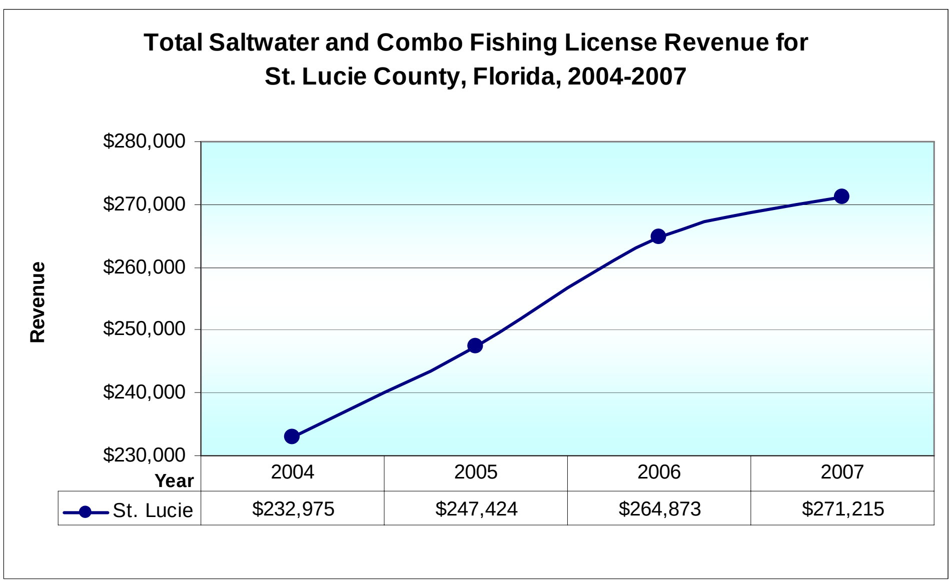
Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

- Palm Beach County saltwater and combo fishing license revenue increased $28,492, or 5%, from 2004-2007.



Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

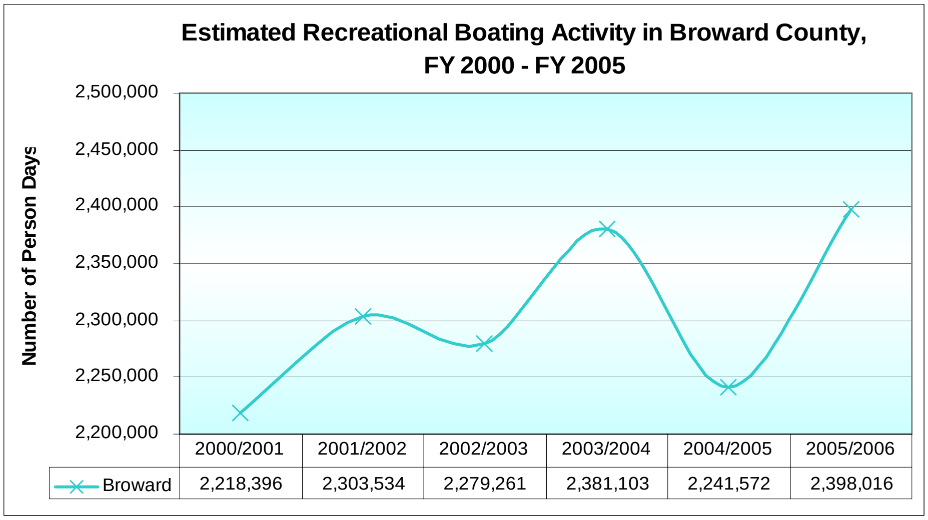
- Polk County saltwater and combo fishing license revenue increased $58,767, or 20%, from 2004-2007.



Source: Office of Licensing and Permitting, Florida Fish and Wildlife Conservation Commission, Communication from Judith Kildow, Monterey Bay Research Institute.

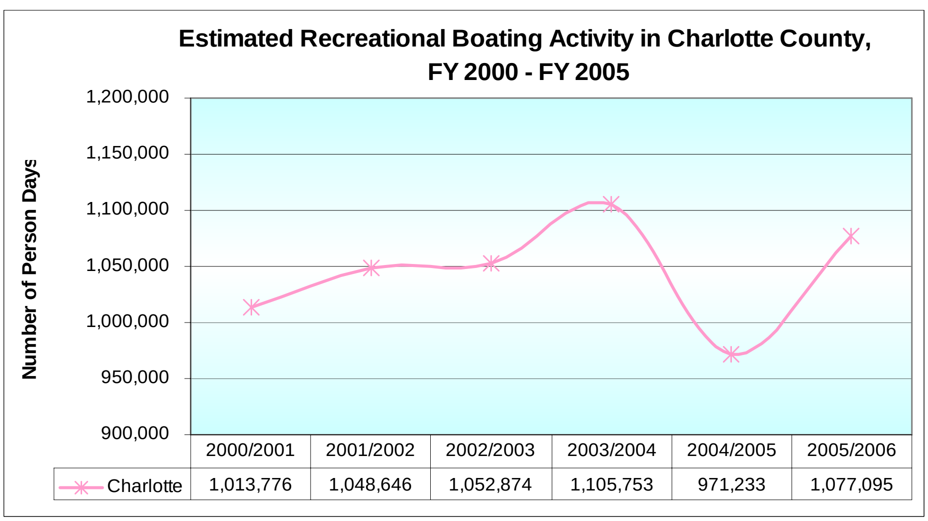
- St. Lucie County saltwater and combo fishing license revenue increased $38,240, or 16%, from 2004-2007.

Estimated Recreational Boating Activity in Everglades Counties



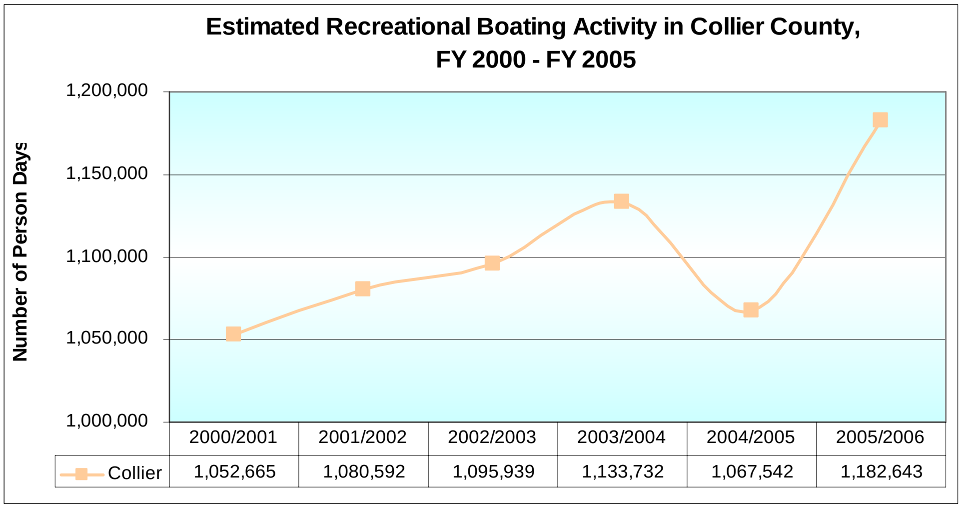
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 8% in Broward County from FY2000 to FY2005, by 179,620 person days.[82]



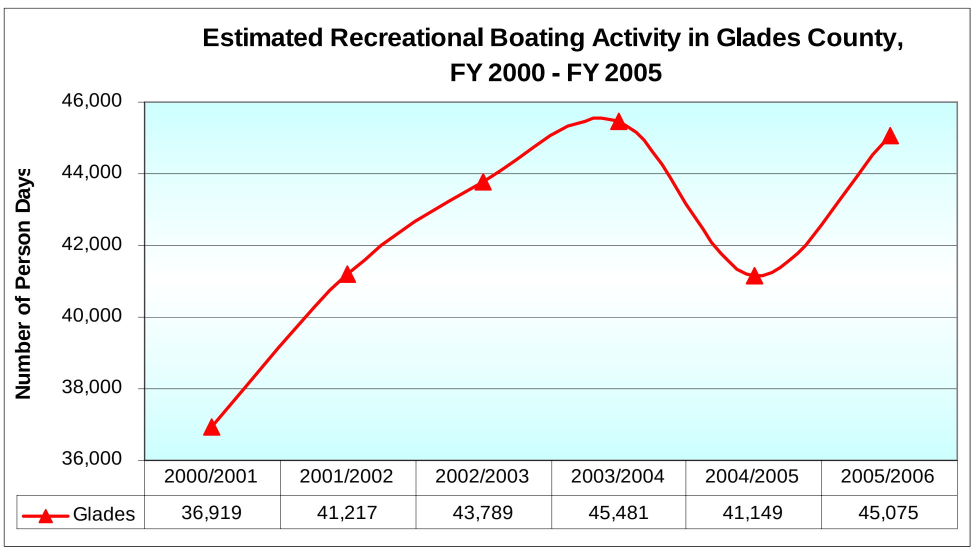
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 6% in Charlotte County from FY2000 to FY2005, by 63,319 person days.[83]



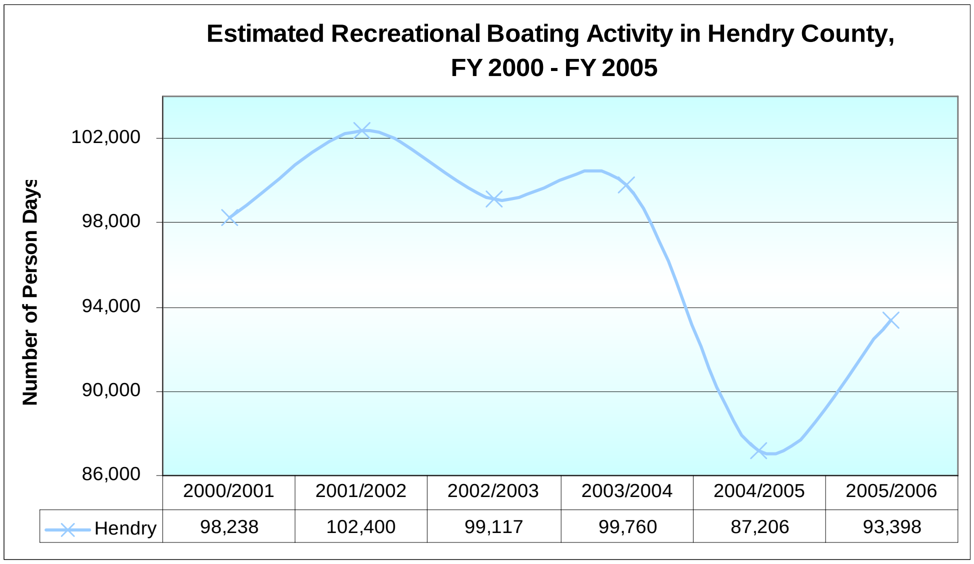
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 12% in Collier County from FY2000 to FY2005, by 129,978 person days.[84]



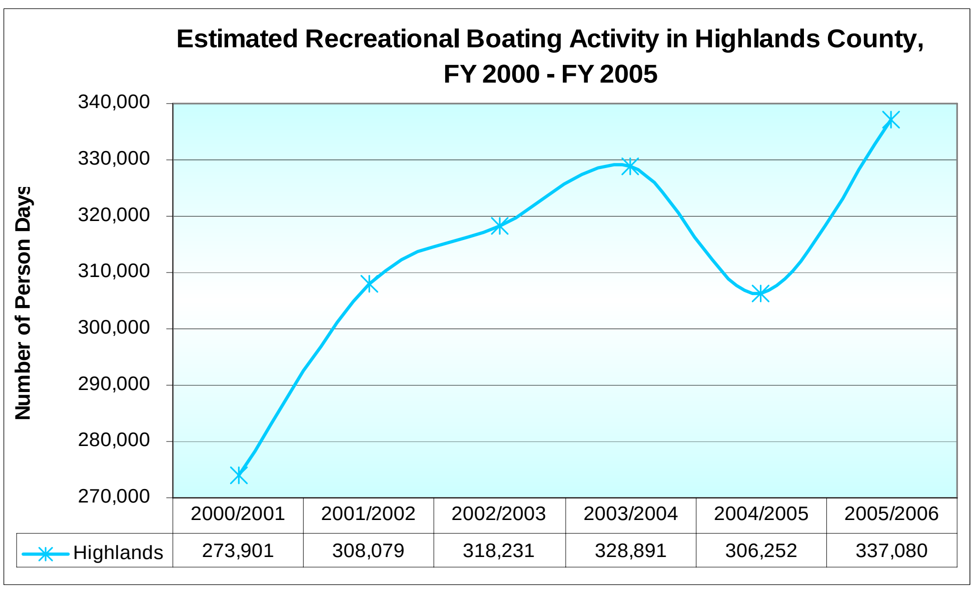
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 22% in Glades County from FY2000 to FY2005, by 8,155 person days.[85]



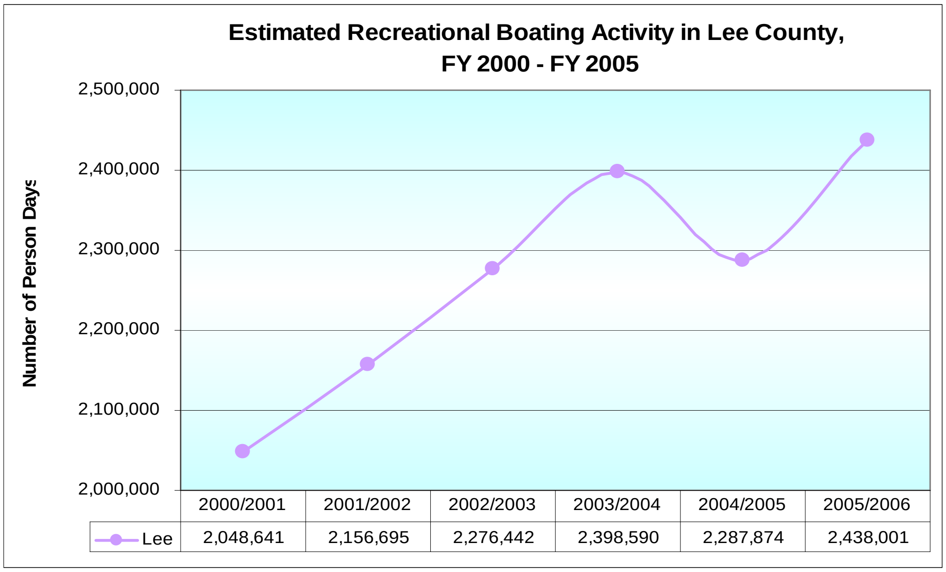
Source: Sidman, C., et al. 2005-2007.

- The number of person days decreased 5% in Hendry County from FY2000 to FY2005, by 4,839 person days.[86]



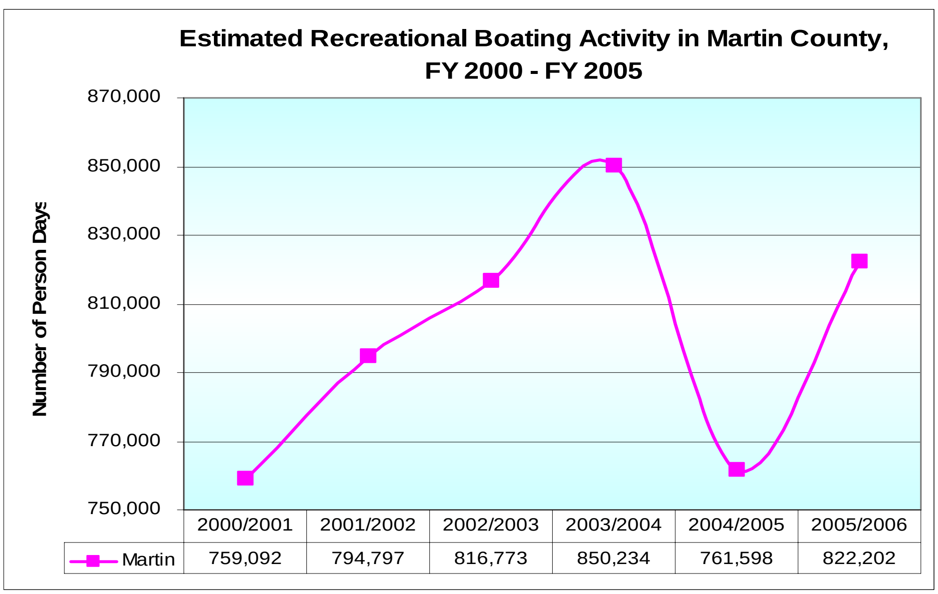
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 23% in Highlands County from FY2000 to FY2005 by, 63,179 person days.[87]



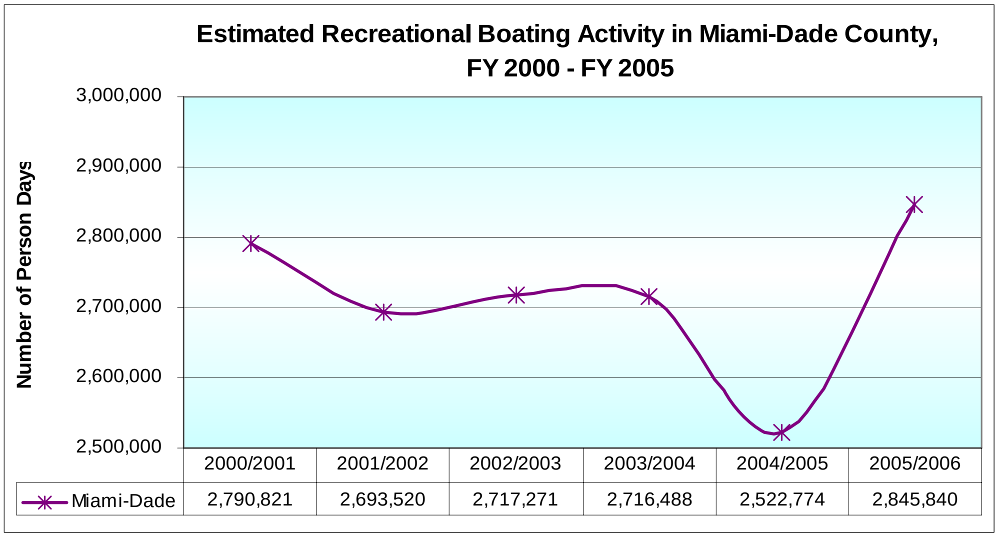
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 20% in Glades County from FY2000 to FY2005, by 389,360 person days.[88]



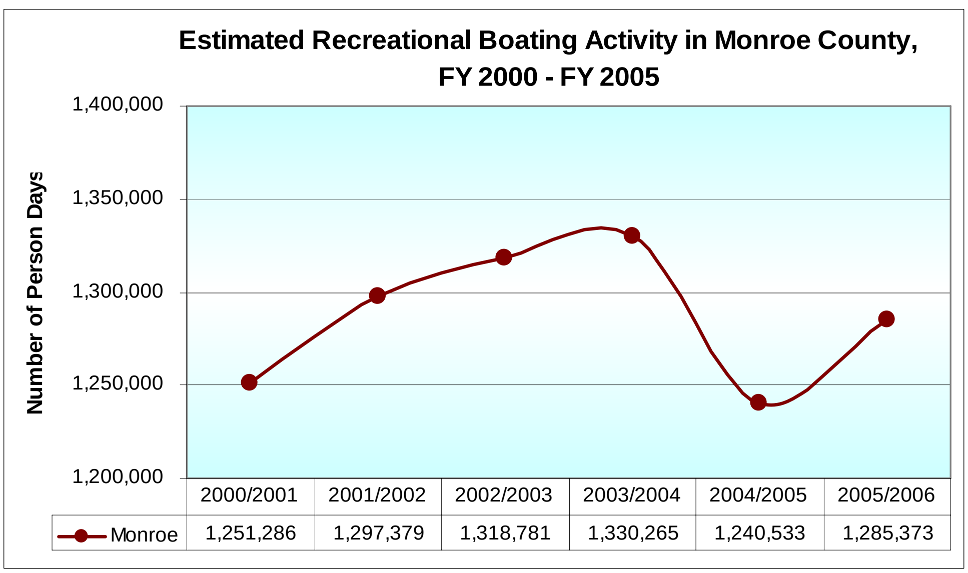
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 8% in Martin County from FY2000 to FY2005, by 63,110 person days.[89]



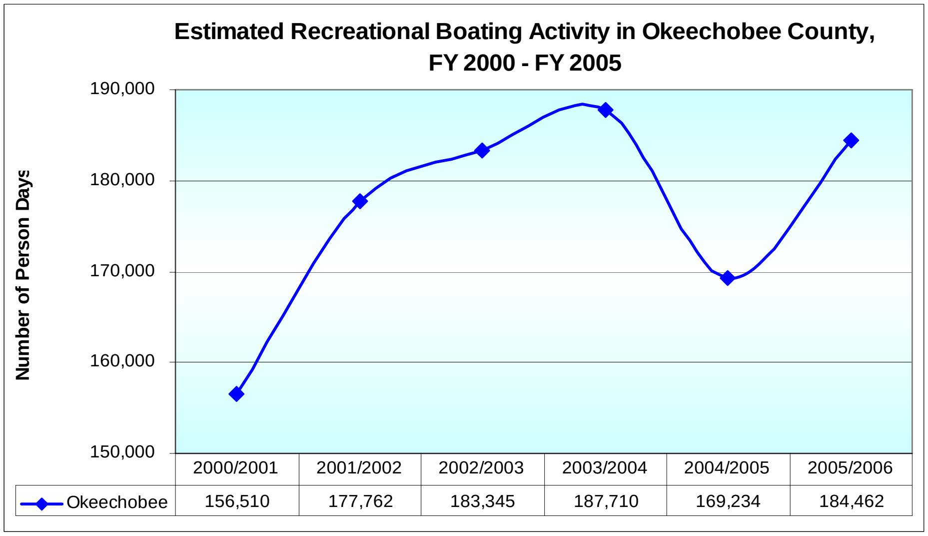
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 2% in Miami-Dade County from FY2000 to FY2005, by 55,019 person days.[90]



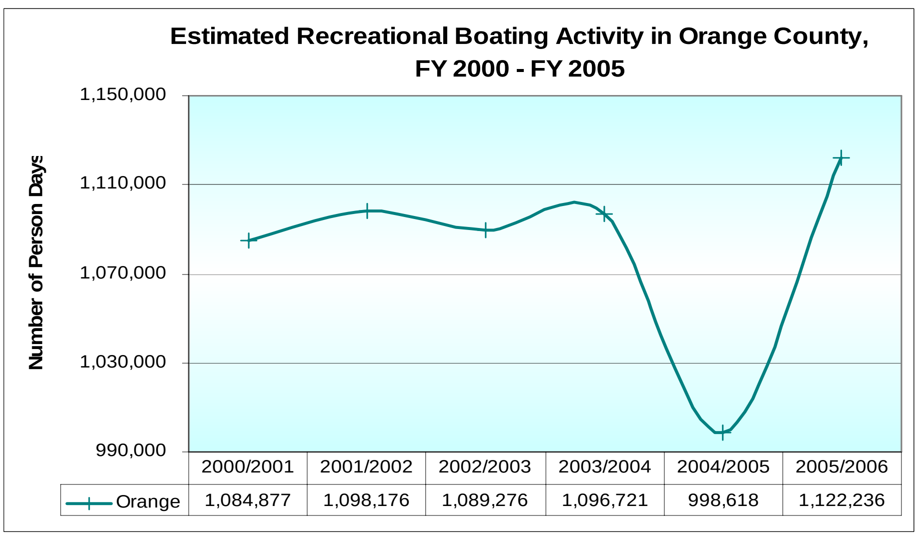
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 3% in Monroe County from FY2000 to FY2005 by 34,087 person days.[91]



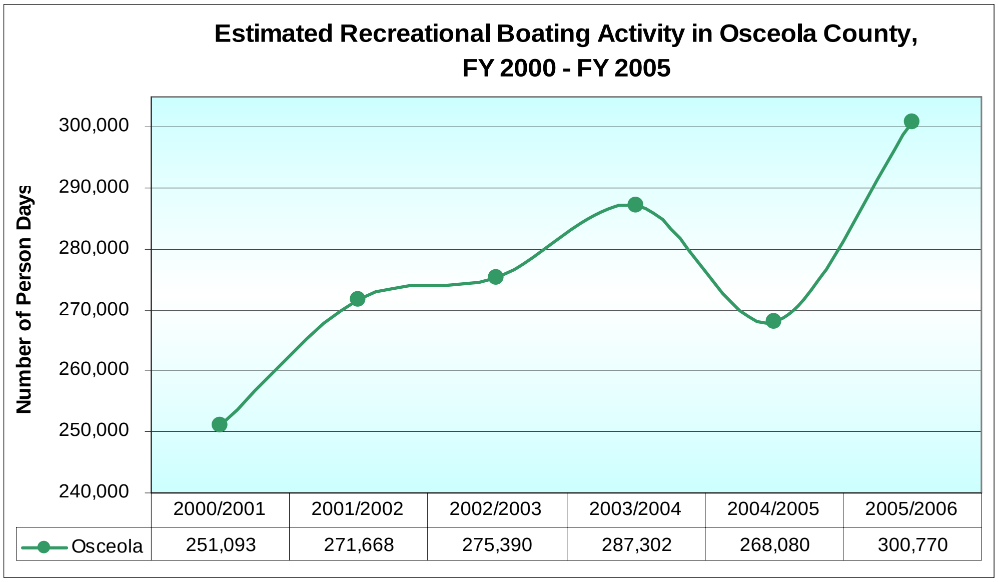
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 18% in Okeechobee County from FY2000 to FY2005, by 27,952 person days.[92]



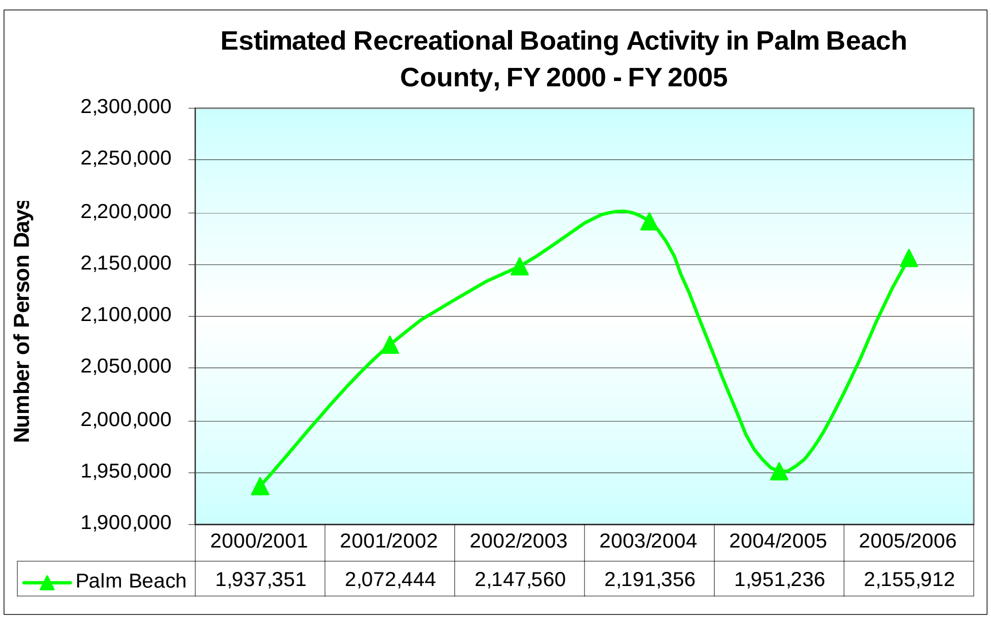
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 3% in Orange County from FY2000 to FY2005, by 37,359 person days.[93]



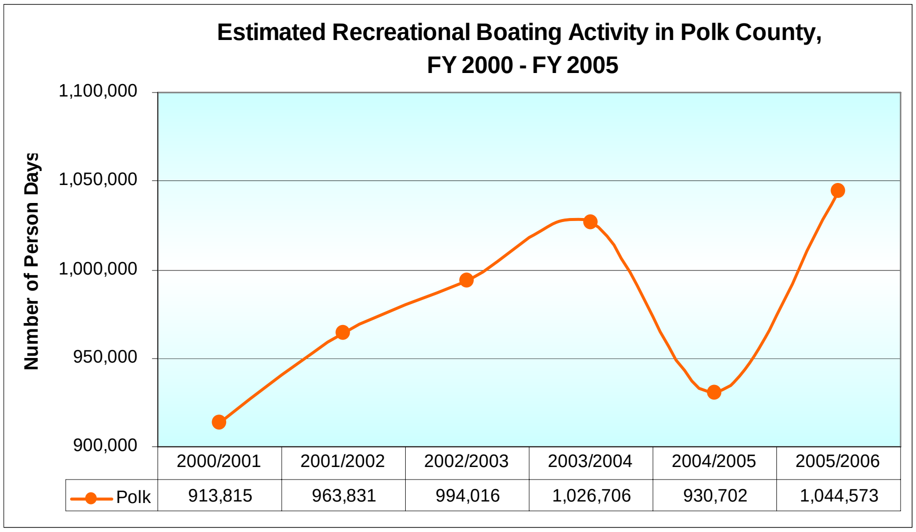
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 20% in Osceola County from FY2000 to FY2005, by 49,677 person days.[94]



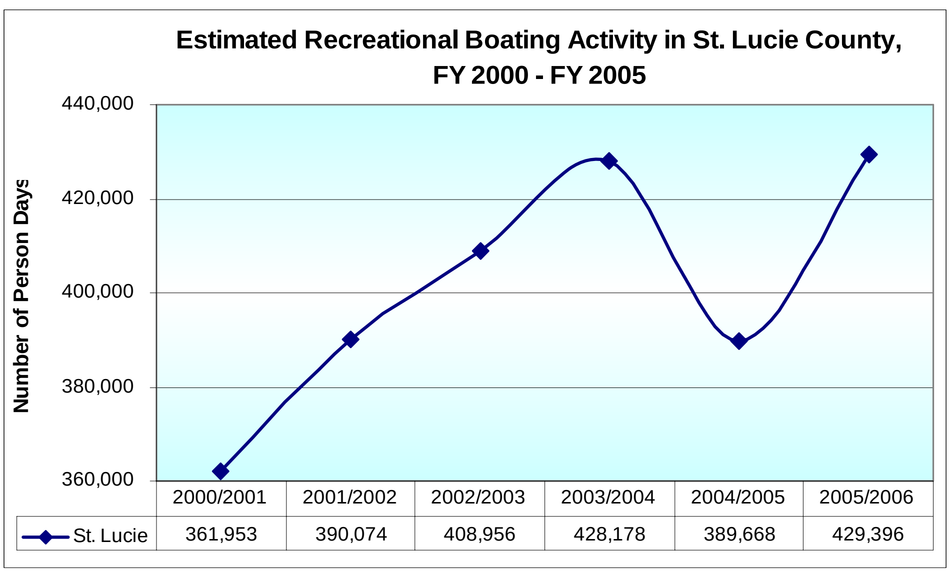
Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 11% in Palm Beach County from FY2000 to FY2005, by 218,561 person days.[95]



Source: Sidman, C., et al. 2005-2007.

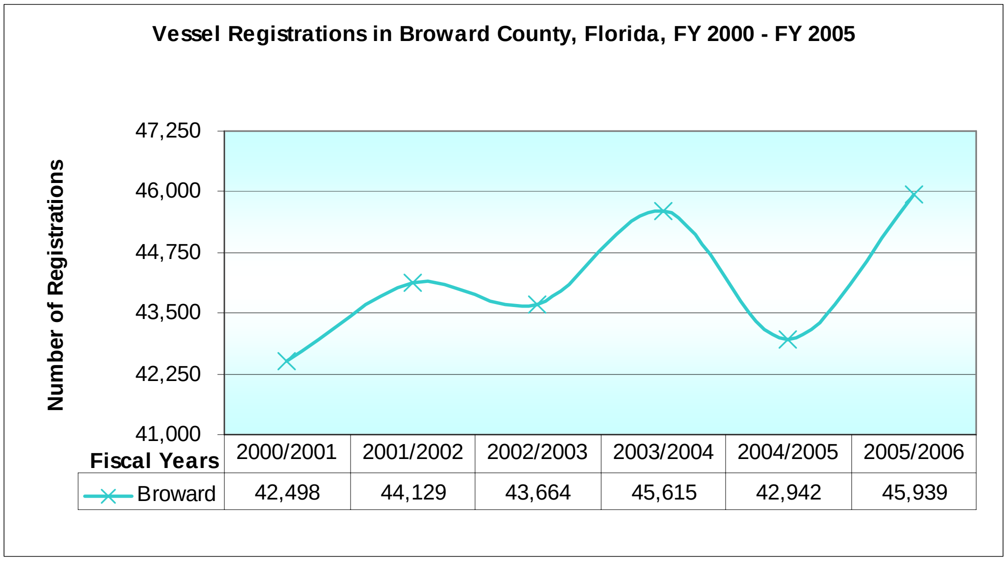
- The number of person days increased 14% in Polk County from FY2000 to FY2005, by 130,758 person days.[96]



Source: Sidman, C., et al. 2005-2007.

- The number of person days increased 19% in St. Lucie County from FY2000 to FY2005, by 67,443 person days.[97]

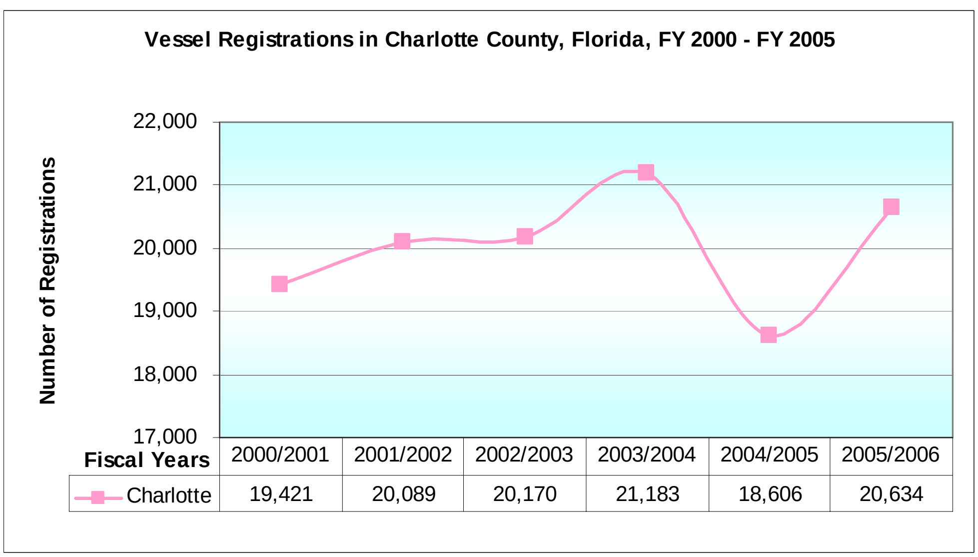
VESSEL REGISTRATION FOR EVERGLADES STUDY AREA



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Broward	42,498	44,129	43,664	45,615	42,942	45,939

Source: Department of Highway Safety and Motor Vehicles

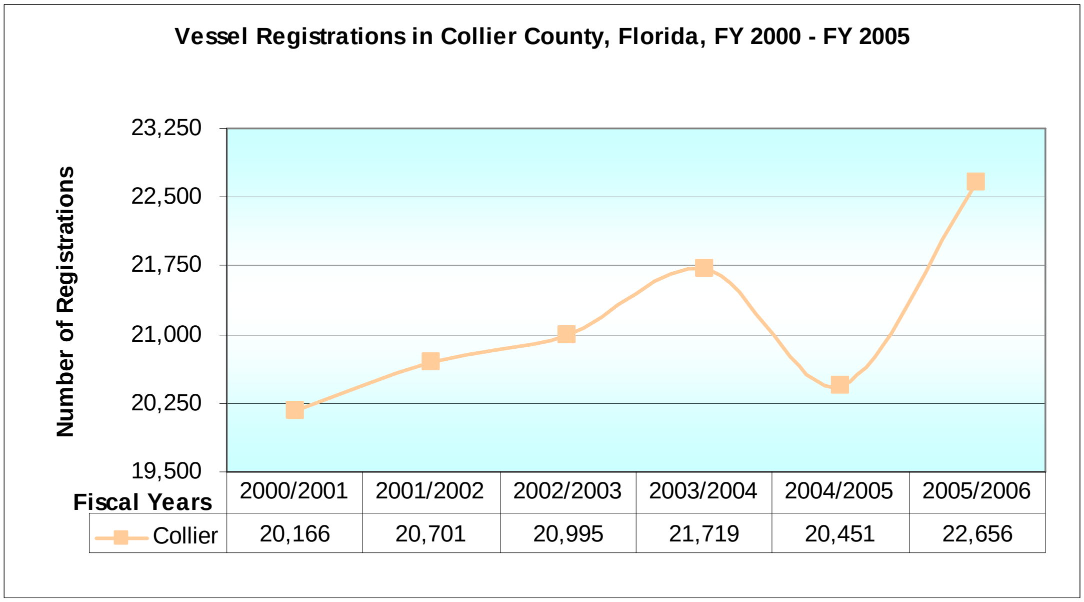
- Vessel registrations in Broward County increased by 3,441, or 8%, between FY 2000 - FY 2005.



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Charlotte	19,421	20,089	20,170	21,183	18,606	20,634

Source: Department of Highway Safety and Motor Vehicles

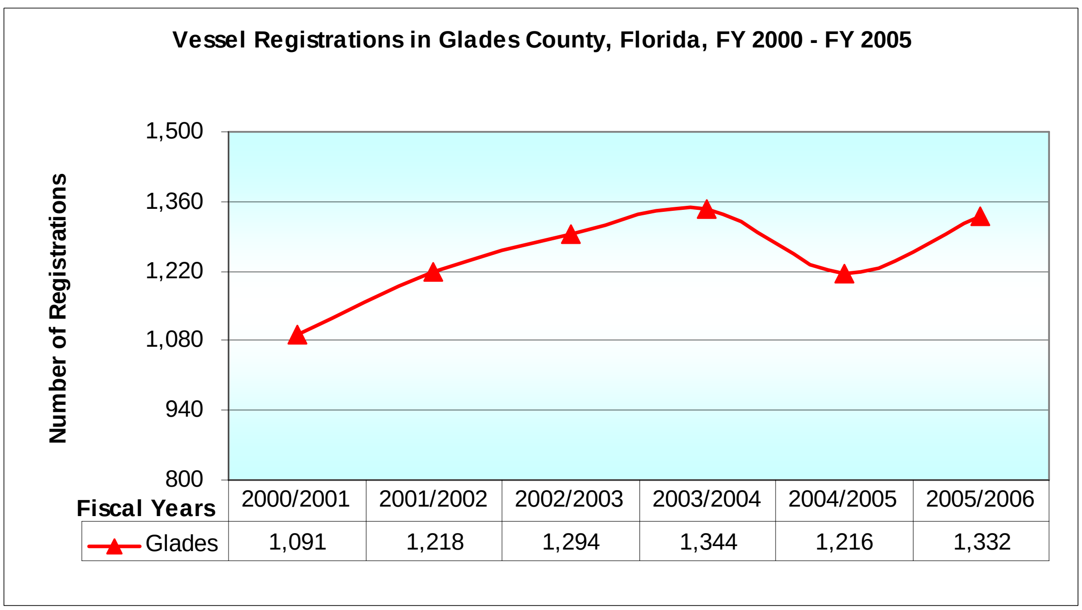
- Vessel registrations in Charlotte County increased by 1,213, or 6%, between FY 2000 - FY 2005.



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Collier	20,166	20,701	20,995	21,719	20,451	22,656

Source: Department of Highway Safety and Motor Vehicles

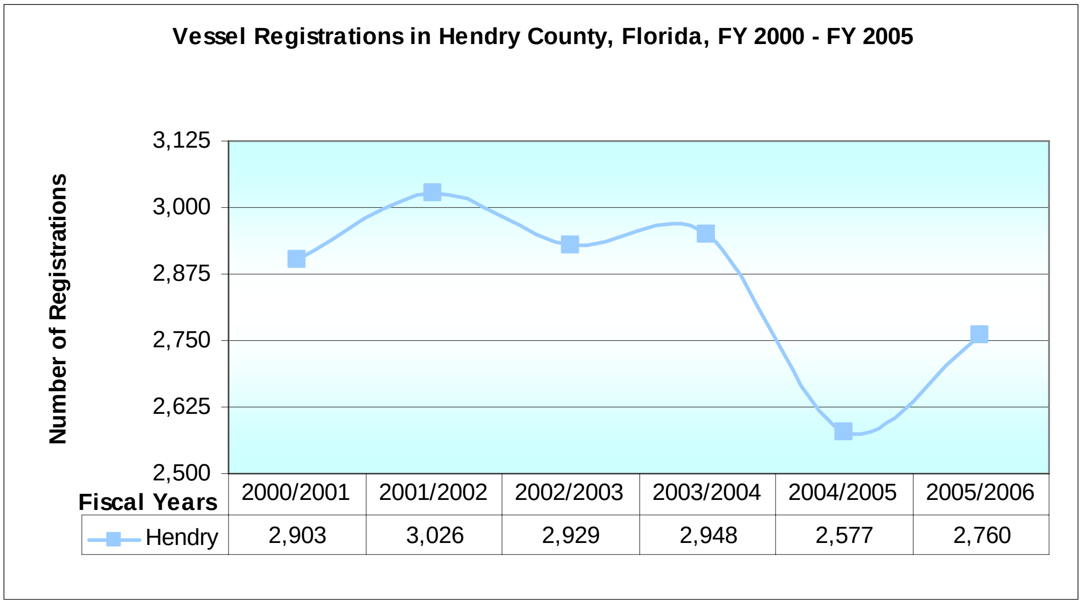
- Vessel registrations in Collier County increased by 2,490, or 12%, between FY 2000 - FY 2005.



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Glades	1,091	1,218	1,294	1,344	1,216	1,332

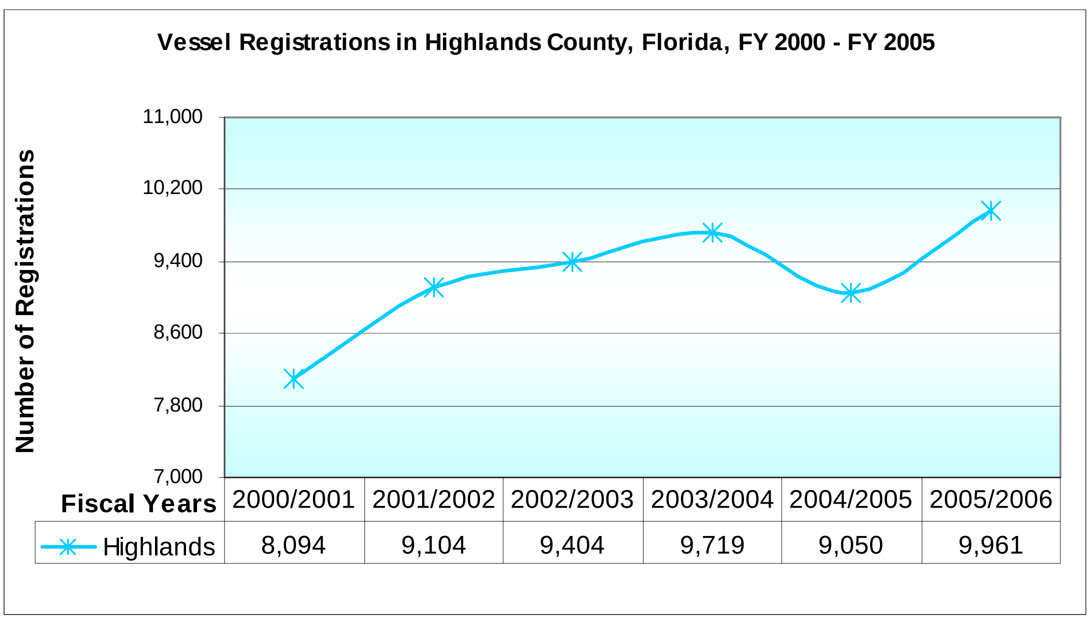
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Glades County increased by 241, or 22%, between FY 2000 - FY 2005.



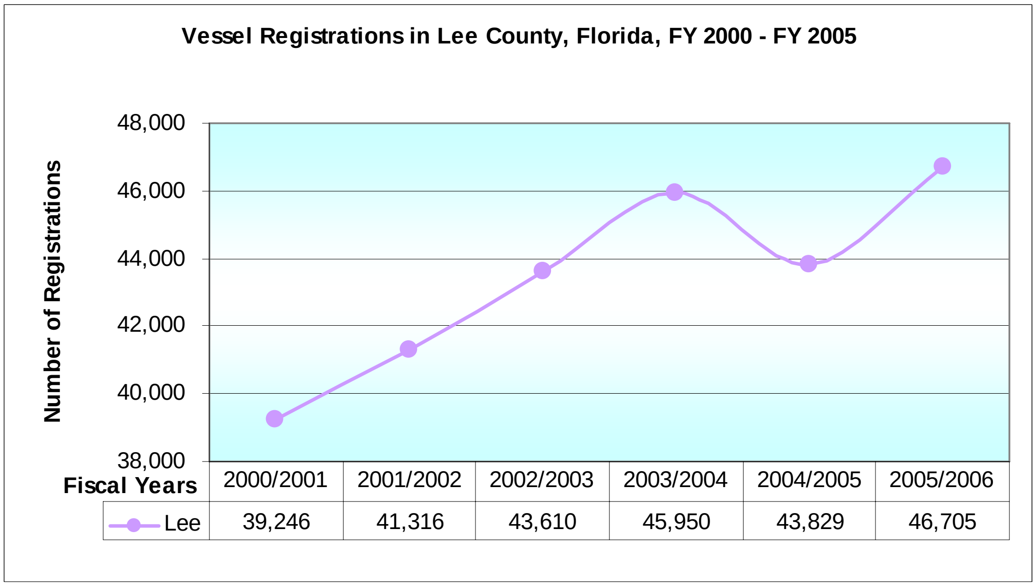
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Hendry County decreased by 143, or 5%, between FY 2000 - FY 2005.



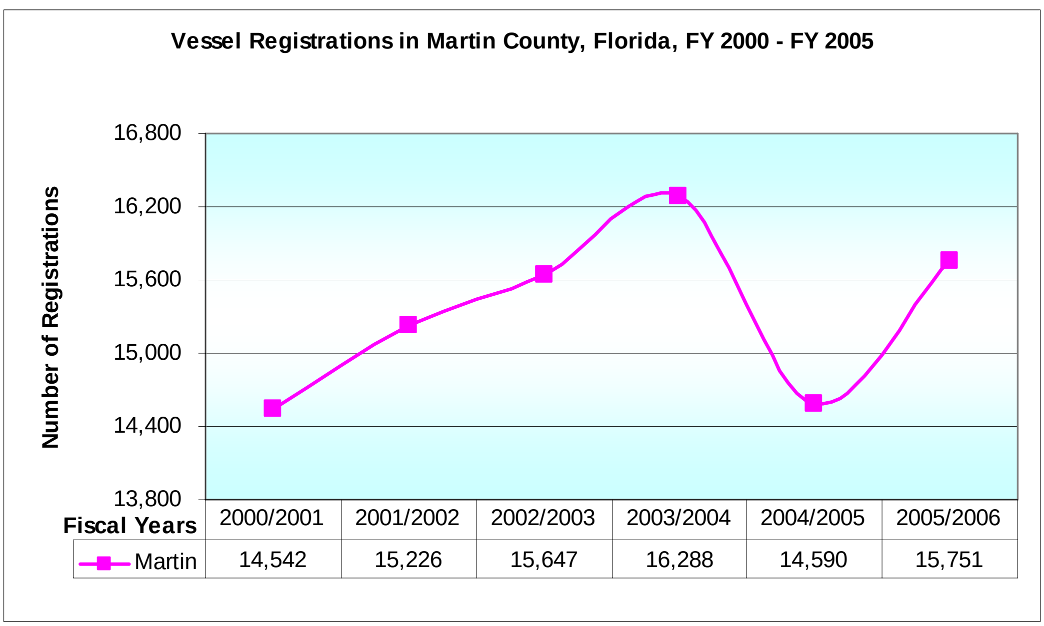
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Highlands County increased by 1,867, or 23%, between FY 2000 - FY 2005.



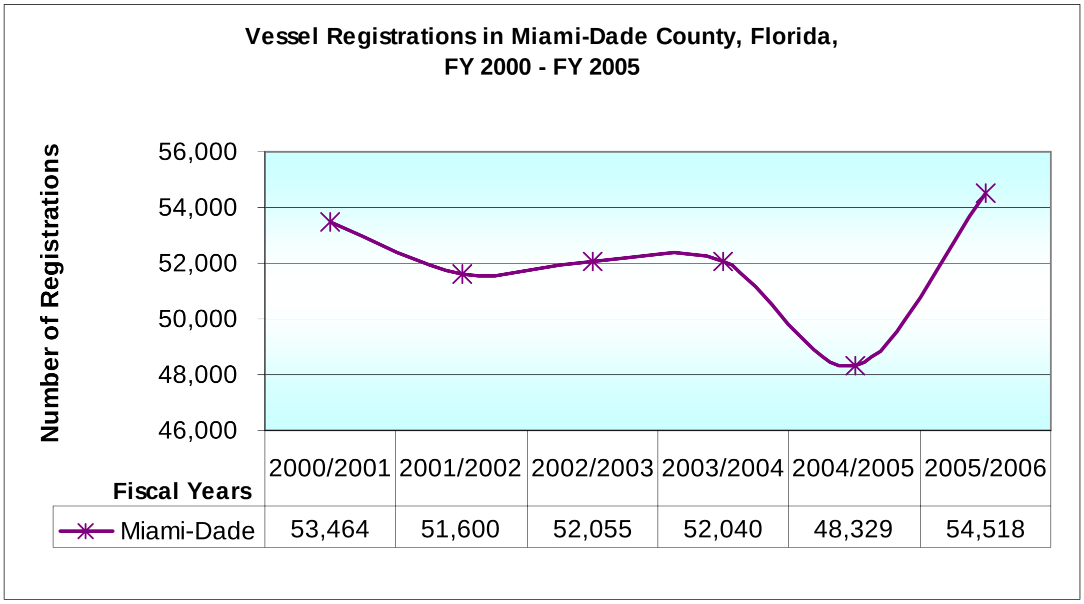
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Lee County increased by 7,459, or 19%, between FY 2000 - FY 2005.



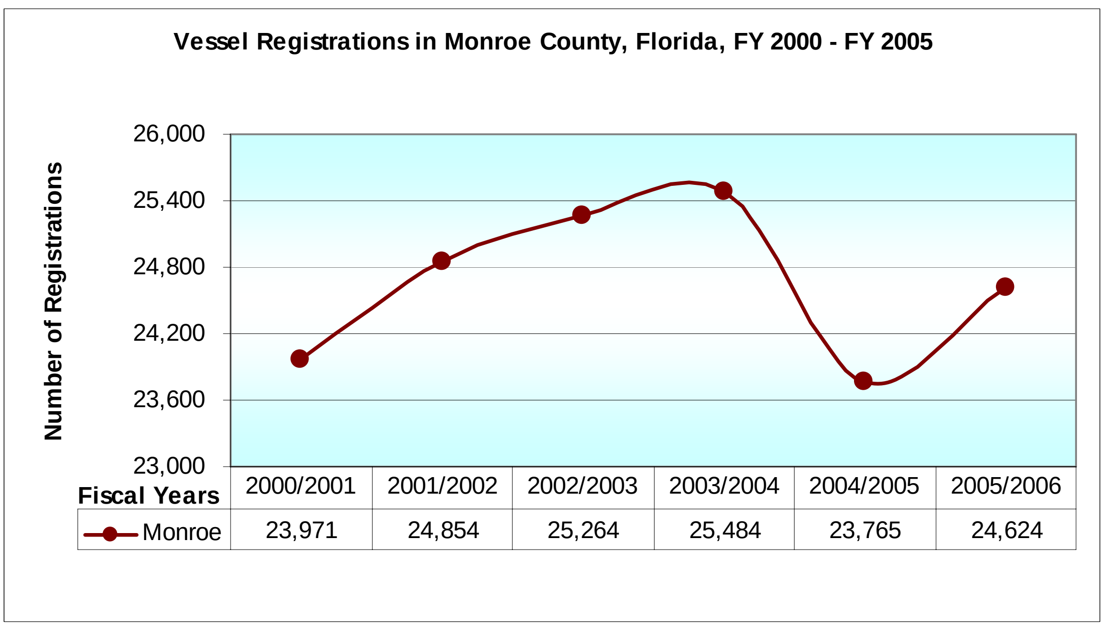
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Martin County 1,209, or 8%, between FY 2000 - FY 2005.



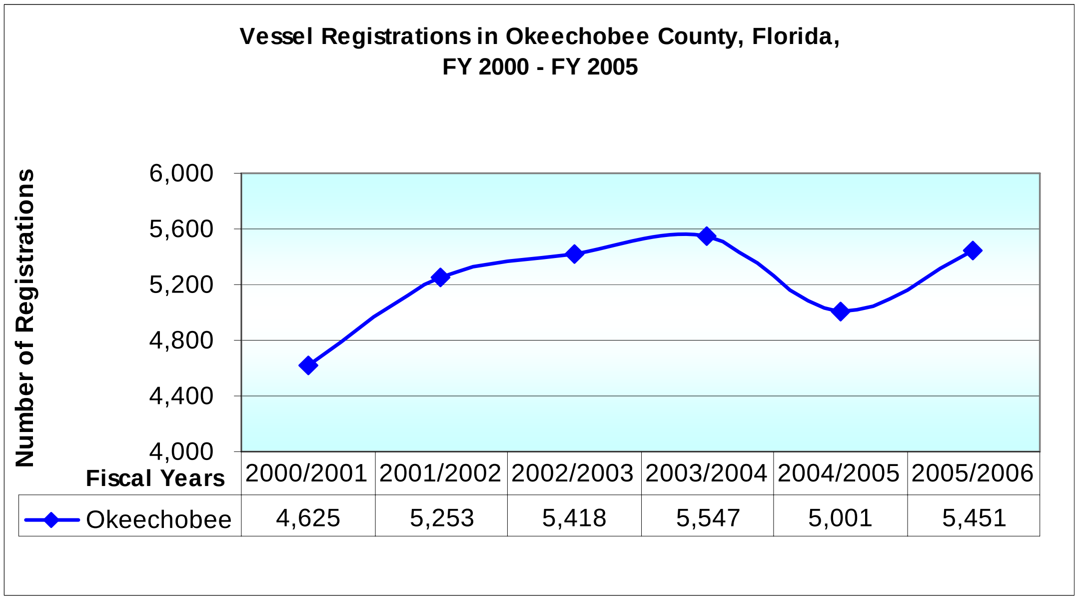
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Miami-Dade County increased by 1,054, or 2%, between FY 2000 - FY 2005.



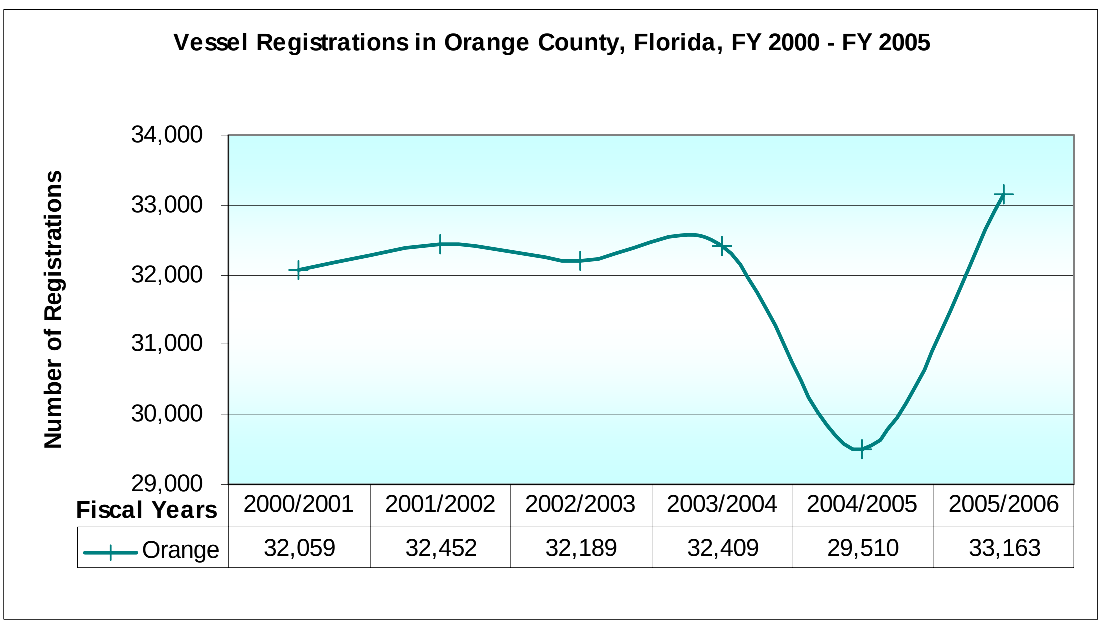
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Monroe County increased by 653, or 3%, between FY 2000 - FY 2005.



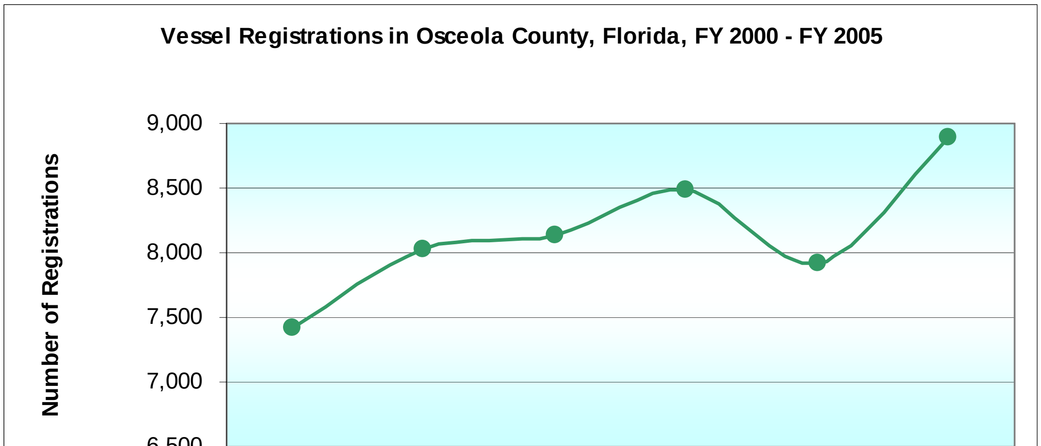
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Okeechobee County increased by 826, or 18%, between FY 2000 - FY 2005.



Source: Department of Highway Safety and Motor Vehicles

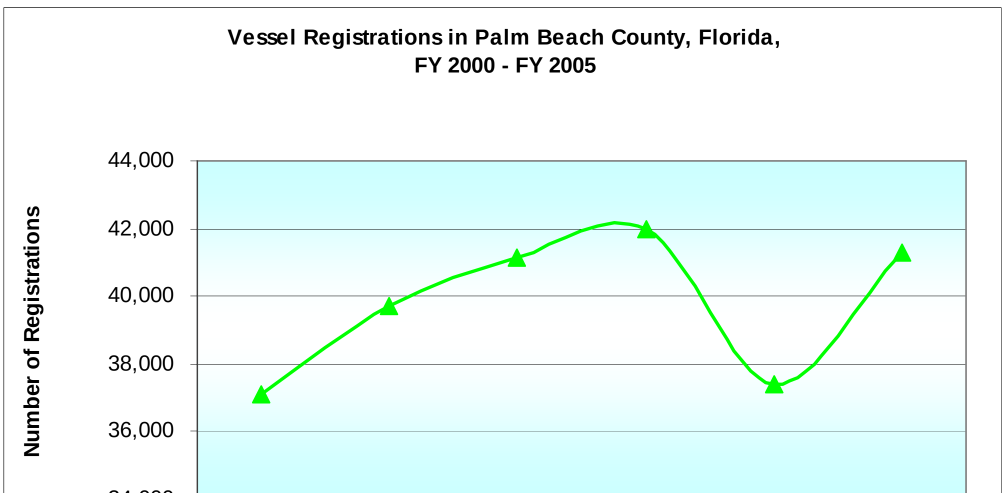
- Vessel registrations in Orange County increased by 1,104, or 3%, between FY 2000 - FY 2005.



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Osceola	7,420	8,028	8,138	8,490	7,922	8,888

Source: Department of Highway Safety and Motor Vehicles

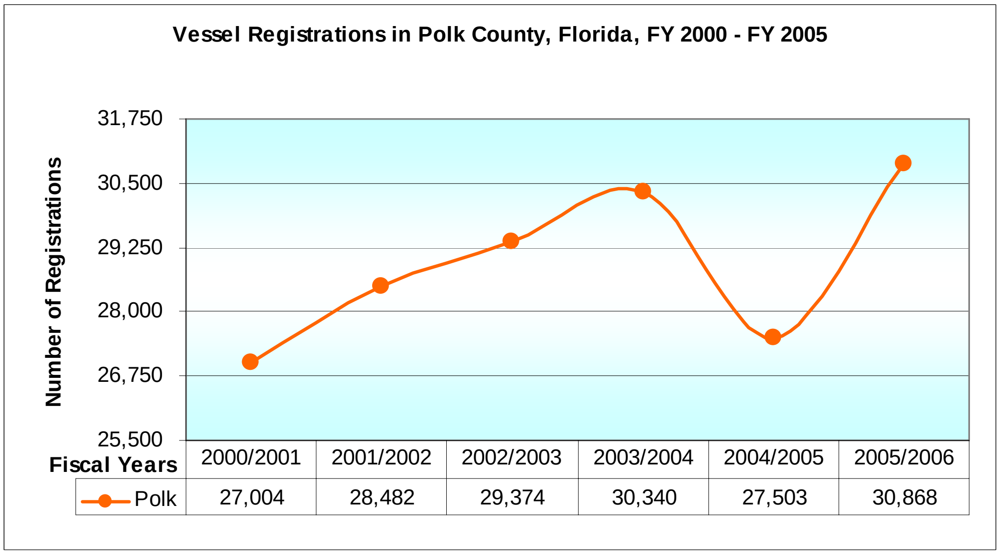
- Vessel registrations in Osceola County increased by 1,468, or 20%, between FY 2000 - FY 2005.



Fiscal Years	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
Palm Beach	37,114	39,702	41,141	41,980	37,380	41,301

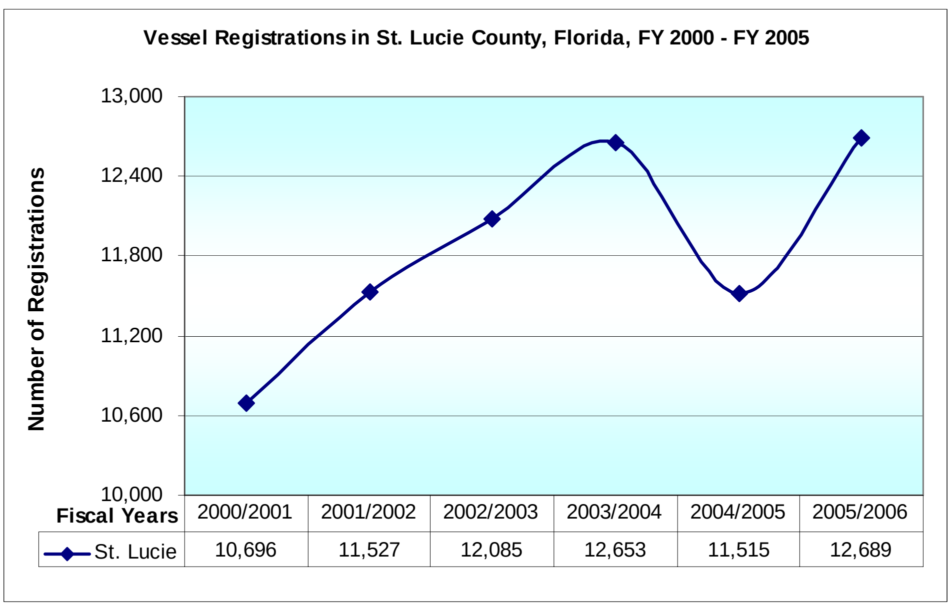
Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Palm Beach County increased by 4,187, or 11%, between
FY 2000 - FY 2005.



Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in Polk County increased by 3,864, or 14%, between FY 2000 - FY 2005.



Source: Department of Highway Safety and Motor Vehicles

- Vessel registrations in St. Lucie County increased by 1,993, or 19%, between FY 2000 - FY 2005.

VIII. ENDNOTES

[1] Florida Agency for Workforce Innovation (2008). *Quarterly Census of Employment andWages (QCEW).* June 2008.

[2] Note: The Flamingo parking area is the only area in which boats are estimated. Rangers take a daily count of boat trailers and multiply by 2.7 for an estimate of the number of boats in Flamingo bay.

[3] Only portions of Charlotte, Highlands, Polk, Osceola and Orange counties are included in the watershed proper. Since data are usually made available by county, the full 16 counties overstate the size of the watershed.

[4] The data come from the 2000 Census of Population as published the 2007 Florida Statistical Abstract, TABLE 8.03

[5] The population estimates were obtained from the US Bureau of the Census at www.census.gov.

[6] Estimates of gross domestic product were developed by the Bureau of Economic Analysis of the US Department of Commerce for metropolitan areas and can be found at www.bea.gov. Some of the areas for which estimates were developed included groups of counties, such as Miami-Dade, Broward and Palm beach counties and, also, Martin and St. Lucie counties. Other areas included only single counties such as Collier, Lee, Charlotte and Polk counties. Orange and Osceola counties were grouped in an area that also included Lake and Seminole counties. The gross domestic products for Orange and Osceola were estimated by the author using (labor) earnings data for the individual counties (available as part of the personal income data prepared by the Bureau of Economic Analysis, and the ratio of gross domestic product to earnings in the metropolitan area as a whole. Earnings data for counties not included in the metropolitan area data (Monroe, Glades, Hendry, Highlands and Okeechobee) were also used as a basis for estimating their gross domestic products. The Collier County ratio of gross domestic product to earnings was used in the case of Monroe County, and the Charlotte County ratio was used for the other non-metropolitan counties.

[7] Florida Agency for Workforce Innovation (2008). *Quarterly Census of Employment andWages (QCEW).* June 2008.

[8] The data are from the US Geological Survey and were reproduced in the 2007 Florida Statistical Abstract, TABLE 8.41. There was a very small amount of water supplied saline groundwater sources.

[9] The data are from the US Geological Survey and were reproduced in the 2007 Florida Statistical Abstract, TABLE 8.43.

[10] "The general concept of a **metropolitan area** is that of a large population nucleus, together with adjacent communities having a high degree of social and economic integration with that core. Metropolitan areas comprise one or more entire counties, except in New England, where cities and towns are the basic geographic units. The Office of Management and Budget (OMB) defines metropolitan areas for purposes of collecting, tabulating, and publishing federal data. Metropolitan area definitions result from applying published standards to Census Bureau data. " Quoted from the census website http://quickfacts.census.gov/qfd/meta/long_metro.htm

[11]The gross domestic product of the total of all metropolitan areas is available from the US Bureau of Economic Analysis website www.bea.gov. The gross domestic product of non-metropolitan areas was obtained by subtracting metropolitan GDP from GDP for the country as a whole. The latter is also available on the BEA website.

[12] An industrial quotient is the ratio of the share of metropolitan GDP accounted for by the industry divided by the share of GDP in the country accounted for by the industry. If the location quotient exceeds unity it indicates that the industry's share of metropolitan is greater than its share of GDP as a whole.

[13] The rise of the Florida tourism-retirement industry is chronicled in William B. Stronge (2008), The Sunshine Economy, An Economic History of Florida since the Civil War, Gainesville, Florida: University Press of Florida, chapters 9-14.

[14] Population growth in the state has usually been more than twice that national rate over the past half century. See William B. Stronge, 2008), Chart 11-7 on page 195, and pages 230,231. Much of the growth has been in the Everglades Watershed counties.

[15] Weiskoff's Lower West coast region is expanded to include Charlotte County, and his Kissimmee Valley region is expanded to include Polk and Orange counties.
[16] From the Ecological Society of America. Quoted (with permission) on the website http://www.actionbioscience.org/environment/esa.html
[17] Broward, Collier, Glades, Hendry, Highlands, Lee, Martin, Miami-Dade, Monroe, Okeechobee, Osceola, Palm Beach and St. Lucie counties.
[18] Available on the US Bureau of Labor Statistics website www.bls.gov.
[19] Most of the value of ecosystem services is not included in the gross domestic product measure. The gross domestic product measure was largely developed by the Bureau of Economic Analysis (BEA) of the US Department of Commerce for metropolitan areas and can be found at www.bea.gov. Some of the areas for which estimates were developed included groups of counties, such as Miami-Dade, Broward and Palm Beach counties and, also, Martin and St. Lucie counties. (Labor) earnings data produced by the BEA for counties not included in the metropolitan area data (Monroe, Glades, Hendry, Highlands and Okeechobee) were used as a basis for estimating their gross domestic products. The Collier County ratio of gross domestic product to earnings was used in the case of Monroe County, and the Charlotte County ratio was used for the other non-metropolitan counties.
[20] Casey et al. (2008) Appendix I.
[21] The details of the consumer price updating are not provided in Casey et al.
[22] The data on tourism was compiled by tourist marketing agencies in Miami-Dade, Broward, Palm Beach, Monroe, Collier, Lee, Osceola and Orange counties. The data from the tourist marketing agencies were obtained from their websites:

County	**Tourism Marketing Agency**	**Website**
Miami-Dade	Greater Miami CVB	http://www.miamiandbeaches.com
Broward	Greater Ft. Lauderdale CVB	http://www.sunny.org/
Palm Beach	Palm Beach County TDC	http://www.pbcgov.com/touristdevelopment/
Collier	Naples, MI Everglades CVB	http://www.paradisecoast.com/
Lee	Lee County CVB	http://www.leecvb.com/
Monroe	Monroe County TDC	http://www.monroecounty-fl.gov/Pages/MonroeCoFL_TDC/index
Orange	Orlando/Orange County CVB	http://www.orlandoinfo.com/
Osceola	Kissimmee CVB	http://www.floridakiss.com/

Notes: CVB = Convention and Visitors Bureau. TDC = Tourist Development Council. MI=Marco Island. Data are usually under research or statistics headings and may be in press or media, or members or partners sections.

In most cases, data were obtained on the number of visitors and their expenditures. For counties where data on total visitors were not available, the ratio total visitors to the number of licensed transient lodging units in a nearby similar county was used to estimate total visitors. Data on licensed transient lodging units were obtained downloaded from the Division of Hotels and Restaurants of the Florida Department of Business and Professional regulation website

There were differences in definitions and methodologies among the counties. The data usually refer to 2007, although, in some cases, data referred to the most recent 12 months. Generally, the different counties were focused on overnight tourists in contrast to day trippers but they included visitors from Florida as well as out-of-state tourists. Included in the tourist estimates for some counties were residents of other counties in the Everglades Watershed Region.
[23] The proportions of visitors who engaged in everglades recreational activities for the counties for which data were available is given in the following table:

County	Activity	Percent
Miami-Dade	Visit Everglades National Park	3.7
Palm Beach	Visit Wildlife Refuge	4.1
Monroe	Viewing Wildlife	13.1
Collier	Everglades Adventures	10.9
Lee	Day Trip to Everglades	12.2

The proportions from nearby counties were used for counties for which data were not available. The Palm beach County proportion of 4.4 percent was applied to Orange County tourists, the largest tourist destination in the region.

[24] The RIMS II models used the 2006 annual national input output model scaled down to Florida using 2006 data on the state. The average of the "multipliers" for retail trade and accommodations (which were very close in value) was used in deriving the estimates. The tourist expenditures data were reduced by 5 percent to allow for inflation between 2006 and 2007 in calculating the number of jobs created.

[25] Pendleton, Linwood, ed. 2008. *The Economic and Market Value of Coasts and Estuaries: What's At Stake?* Restore America's Estuaries. Executive Summary. Available on line http://www.estuaries.org/?id=208.

[26] Ibid. p.45. Estuary Regions in Florida include Florida Atlantic, Southern Gulf, and Eastern Gulf.

[27] Restore America's Estuaries. 2002. *A National Strategy to Restore Coastal and Estuarine Habitat Estuary*. Available online http://www.estuaries.org/assets/documents/NationalStrategyFull.pdf
Regions in Florida include Florida Atlantic (South Florida, the Florida
Keys, the Everglades and Florida Bay); Southern Gulf (Gulf Coast of Florida south of Anclote Key to Cape Romano), and Eastern Gulf (The upper Gulf Coast of Florida, south to Anclote Key).

[28] Pendleton, Linwood. 2008. p.143-144.

[29] Ibid Table 3. p. 153

[30] National Ocean Economics Program. Market Data. Ocean Economy Data. Retrieved October 23, 2008, from http://noep.mbari.org/Market/ocean/oceanEcon.asp?IC=N

[31] The Indian River Lagoon System comprises the counties of Volusia, Brevard, Indian River, St. Lucie, and Martin.

[32] Expenditures for restoration, research, education and commercial fishing dockside values were not allocated by county in the study. This author distributed the five county totals using the share of each county in reported direct market expenditures.

[33] Hazen and Sawyer. (2008, August 18,). *Indian River Lagoon Economic Assessment and Analysis Update.* Executive Summary, p. 1.

[34] Hazen and Sawyer. (2005, April). Biscayne Bay Economic Study. Task 3 Report-Final Biscayne Bay Economic Baseline and Trend Report. P. ES-4. Table ES-1.

[35] Ibid. P. 3-9, 3-10, 3-12. Table 3.2-1

[36] Economic growth patterns were not calculated for Biscayne National Park due to its proximity to a large urban area (Miami) and the resulting confounding effects.

[37] Biscayne National park contains part of the third largest coral reef system in the world and the largest stretch of mangrove forests remaining on Florida's east coast.

[38] The Money Generation Model 2 (MGM2), which calculates data obtained through surveys, was used to estimate the economic impacts of visitors to national parks. MGM2 multiplies the number of park visitors by average spending per visitor and regional economic multipliers. The MGM2 model calculates both the direct spending, or the initial spending, of visitors, and the secondary effects, or the re-circulation of money through the local economy.

[39] The Florida Bay Education Project. Retrieved October 28, 2008 from, http://www.floridabay.org/intro.shtml.

[40] Audubon of Florida. *The Southern Everglades and Florida Bay: Audubon Recommendations to Achieve Restoration Benefits.* Retrieved October 29, 2008 from, http://www.audubonofflorida.org/PDFs/pubs_policydocs-florida_bay_report_main.pdf.

[41] The export sector is defined as Monroe residents who derive their incomes from outside Monroe County. These include the retirement community and residents that work out of Monroe County.

[42]Leeworthy V.R. (1999, June). *Linking the Economy and Environment of Florida Keys/Florida Bay*. Executive Summary-Resident Survey. NOAA, Special Projects Office. Silver Spring, MD.

[43] Center for Park Management, National Parks Conservation Association. (2006). Impacts of Visitor Spending on the Economy of the Florida City / Homestead Area, Everglades National Park.
[44] The calculated sales multiplier for total direct sales was 1.62 meaning that for every dollar spent, an additional $0.62 in sales in sales is generated through secondary effects.
[45] Direct sales is money captured by the local region. Eleven percent of visitor spending goes outside the local economy for import goods such as gas and oil.
[46] Data for the study was obtained from an Everglades National Park Visitor Survey in 2002 and the National Park Service's Public Use Statistics for 2004.
[47] Party nights are calculated by taking the number of recreation visits and dividing it by the number of park entries per trip and then taking the total and multiplying it by the length of stay in the area and multiplying the result with the party size.
[48] Money put into the local region.
[49] There were several study limitations. The Everglades National Park consists of only a small portion of the entire Everglades. Also, other local areas around other entrances to the Everglades National Park were not studied. Those visiting the Park may also spend time visiting other nearby attractions such as Biscayne National Park of the Florida Keys. The 2002 Visitor Survey may be subject to sampling errors, measurement errors and seasonal biases.
[50] Local day visitors are those who live in the Florida City/Homestead area.
[51] Non-local day visitors are those who do not live in the Florida City/Homestead area.
[52] The purpose of the study was to test the relationship between participation in outdoor activities and socioeconomic factors and to calculate the resident spending. The survey was conducted in 1996 by Florida State University's, Policy Science Program, Survey Research Center. Over 2,900 Monroe County residents completed a phone survey and 600 completed the mail-back portion of the survey.
[53] 2,414 full and part time jobs in Monroe County were generated.
[54] Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Phase II. Florida Oceans and Coastal Council.
[55] There were no State Parks in Osceola, Glades and Hendry Counties.
[56] Southwick Associates. (2007: revised 2008). Sportfishing in America: An Economic Engine and Conservation Powerhouse. Produced for the American Sportfishing Association with funding from the Multistate Conservation Grant Program. Pp. 7-8. Cited in Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Monterey Bay Aquarium Research Institute.
[57] Ibid. See also, Leeworthy, V.R. and P.C. Wiley. (2001). National Survey on Marine Recreation and the Environment 2000: Current Participation Patterns in Marine Recreation. A Report to the U.S. Department of National Oceanographic Atmospheric Administration. Silver Spring, Maryland. pp. 24-25. Cited in Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Monterey Bay Aquarium Research Institute.
[58] Freshwater/Saltwater Combination License types include Resident Freshwater/Saltwater Fishing, Resident Freshwater/Saltwater Fish/Hunt, Resident Gold Sportsman, Military Gold Sportsman, and Lifetime Sportsman (ages 0-4, 5-12, 13-15, and 16-64).
[59] Data does not include 1,735 Charter Licenses or 151,303 Permits for Saltwater Fishing in Everglades study area for FY2006. Saltwater Fishing License types include Resident Saltwater Fishing, Lifetime Saltwater Fishing (ages 0-4, 5-12, and 13-64), Resident 5-year Saltwater Fishing, and Nonresident Saltwater Fishing (annual, 3-day, and 7-day). Freshwater Fishing License types include Resident Freshwater Fishing/Hunting Combo, Resident Sportsman, Resident Sportsman (64 and older), Resident Freshwater Fishing, Lifetime Freshwater Fishing (ages 0-4, 5-12, and 13-64), Resident 5-year Freshwater Fishing, and Nonresident Freshwater Fishing (annual and 7-day).
[60] Saltwater Charter License types include Charter Captain (0-4, 0-10, and 11+ customers), Charter Boat (0-4, 0-6, 0-10, and 11+ customers), and Recreational Vessels.
[61] Saltwater Permits include Resident Snook, Residentbster, Resident 5-year Snook, Resident 5-year Lobster, Nonresident Snook, Nonresident Lobster, Snook Permit-Charter, Lobster Permit- Charter, Snook Permit- Pier, Tarpon Tag, and Saltwater Fishing Pier.
[62] U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. P.9.

[63] Saltwater Fishing License types include Resident Saltwater Fishing, Lifetime Saltwater Fishing (ages 0-4, 5-12, and 13-64), Resident 5-year Saltwater Fishing, and Nonresident Saltwater Fishing (annual, 3-day, and 7-day). Saltwater permits and charters are also included.

[64] Freshwater/Saltwater Combination License types include Resident Freshwater/Saltwater Fishing, Resident Freshwater/Saltwater Fish/Hunt, Resident Gold Sportsman, Military Gold Sportsman, and Lifetime Sportsman (ages 0-4, 5-12, 13-15, and 16-64).

[65] Does not include Combo licenses. Saltwater Fishing License types include Resident Saltwater Fishing, Lifetime Saltwater Fishing (ages 0-4, 5-12, and 13-64), Resident 5-year Saltwater Fishing, and Nonresident Saltwater Fishing (annual, 3-day, and 7-day).

[66] No freshwater fishing license revenue only data is available.

[67] Lobster, Snook, and Tarpoon permits require a saltwater fishing license. Permit types include Resident Snook, Resident Lobster, Resident 5 Year Snook, Resident 5 Year Lobster, Non-Resident Snook, Non-Resident Lobster, Saltwater Fishing Pier, Snook Permit-Charter Boat, Lobster Permit-Charter Boat, Snook Permit-Pier, and Tarpon Tag.

[68] Freshwater/Saltwater Combination License types include Resident Freshwater/Saltwater Fishing, Resident Freshwater/Saltwater Fish/Hunt, Resident Gold Sportsman, Military Gold Sportsman, and Lifetime Sportsman (ages 0-4, 5-12, 13-15, and 16-64).

[69] Includes permits because they are split up by residents and non-residents and does not include charters because they are not split up by residents and non-residents.

[70] Florida Fish and Wildlife Commission. http://myfwc.com/license/

[71] Leeworthy, Vernon R., and Peter C. Wiley. (2001). National Survey on Marine Recreation and the Environment 2000: Current Participation Patterns in Marine Recreation. A Report to the U.S. Department of Congress National Oceanographic Atmospheric Administration. Silver Spring, Maryland. Cited in Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Monterey Bay Aquarium Research Institute.

[72] VAI/ Market Research Online. (2006). 2006 Florida Recreational Boating Survey: Final Report. Cited in Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Monterey Bay Aquarium Research Institute.

[73] Sidman, C., et al. 2005-2007. Cited in Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Monterey Bay Aquarium Research Institute.

[74] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[75] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[76] Kildow, Judith. (2008). Florida's Ocean and Coastal Economies Report, Phase II. Florida Oceans and Coastal Council.

[77] Does not include canoes, kayaks, dealer vessels, or commercial vessels.

[78] Department of Highway Safety and Motor Vehicles.

[79] Conducted by Southwick Associates for the Florida Fish and Wildlife Conservation Commission, the purpose of this project was to quantify the 2006 economic benefits of wildlife viewing in Florida. Data were obtained from the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (Survey) conducted by the U.S. Fish and Wildlife Service and the U.S. Census Bureau. The Survey consists of a wide range of hunting, fishing and wildlife viewing participation, expenditure and demographic information. The data were analyzed using the IMPLAN economic model to generate economic impact estimates for each activity.

[80]These percentages summed do not equal 100%, as participants may have enjoyed multiple activities.

[81] These percentages summed do not equal 100%, as participants may have enjoyed multiple activities.

[82] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average

trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[83] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[84] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[85] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[86] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[87] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[88] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[89] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[90] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[91] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[92] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[93] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average

trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

[94]Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.

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[97] Note: Person Days calculated by multiplying Average Trips/Boater/Month/County Calculator X 12 Months X Vessel Registration. Specific calculator per county is based on the SeaGrant study of average trips/boater, using that # for neighboring counties, and SW #s for SE Florida (where the marine industry estimated that more than half their boaters went out weekly and about half of those several times a week). This methodology is used in all of the Boating Activity tables.