BENEFITS OF CHARLOTTE COUNTY PARKS & NATURAL RESOURCES

CHARLOTTE COUNTY
FLORIDA

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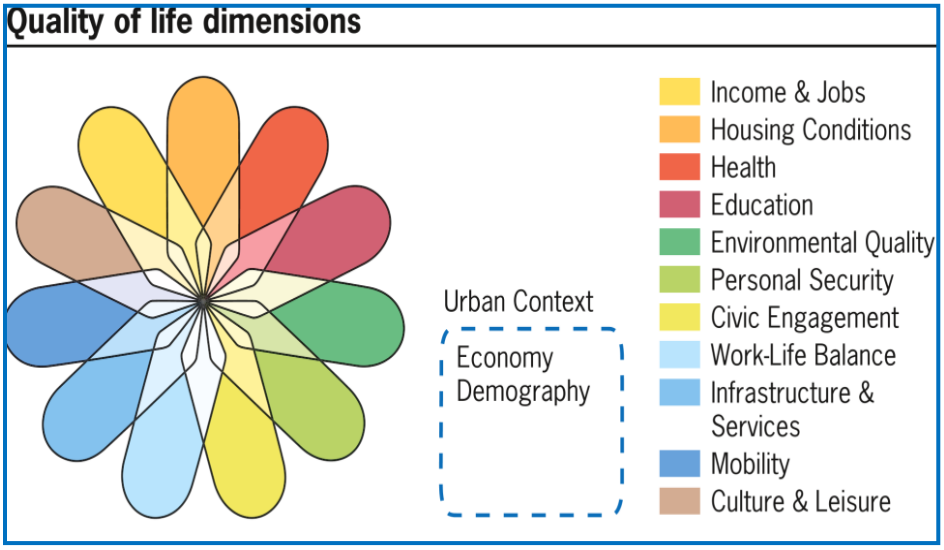
Executive Summary

Charlotte County Parks and Natural Resources has many assets available that improve the comfort and diverse lifestyles of its residents and provides substantial economic benefits to the County. The County boasts over **5,100 acres** of waterfront and environmentally protected property available for beachfront park activities, boating, kayaking, paddle boarding, bird watching, fishing, and other environmental activities. Parks and preserves also offer a variety of opportunities for people of all ages, income levels, race, religion, gender, and physical abilities to interact, learn, and grow, contributing to a community that is stronger, safer, and more successful. Charlotte County Community Services Parks and Natural Resources Division provide some of the following benefits:

- Charlotte County Parks and Natural Resources Division encourage a healthy, active lifestyle. Parks and preserves provide the opportunity for citizens to control their weight, strengthen their bones and muscles, and reduce their risk of cancers, cardiovascular diseases, and type-2 diabetes, as well as numerous other health benefits.
- Parks and preserves improve mental health and mood. Studies have shown that participating in outdoor recreational activities and being outdoors in nature can reduce anxiety and depression. Being in nature can also increase your sense of balance, self-esteem, and connection to your community.
- Green spaces in Charlotte County improve water quality, reduce the cost of stormwater management, prevent flooding, and help reduce nuisance pest activities such as mosquitoes. The 5,100 acres that make up Charlotte County parks and preserves mitigate approximately **727,952,591** gallons of stormwater annually, which saves Charlotte County **$3,892,524**.
- Trees and shrubs at Charlotte County facilities remove air pollutants that endanger human and environmental health, and damage structures. They also serve to mitigate climate changes that include modified temperatures, wind, rain, and air quality patterns.
- Charlotte County staff helps to protect both state and federally listed species. Some of the ways that Charlotte County protects these species is by acquiring conservation lands, managing natural habitats, species monitoring, coordination with other conservation programs, and ensuring state and federal permitting requirements are met.
- Parks and preserves increase the value of nearby residential properties because parks provide many desirable assets such as playgrounds and large open grassy spaces, prime biking, walking and nature watching locations, and increased socialization opportunities. Homes within 2,000 feet from Charlotte County parks and preserves can have an increased home value of **$7,000-$8,000.**
- Charlotte County set a monthly record with **$468,992** of tourism development tax collections in May 2021, which is an increase from May 2019 and May 2020 of 102% and 195%, respectfully. From January to May of 2021, collections are up 25.5% versus 2019 and 30.6% over 2020.
- During the 2021 fiscal year, 863,000 individuals visited Charlotte County. Visitor spending in Charlotte County generated a total economic impact of **$844,435,500**. This economic impact supported 10,752 local jobs and generated **$248,251,200** in local wages and salaries. Additionally, each household in Charlotte County saved **$875** in taxes as a result of tourism.

Introduction

It is impossible to imagine what Charlotte County would be like without the positive environmental, economic, and social impacts Charlotte County Community Services provide with their parks and preserves. Over 5,100 acres of facilities are available for visitors to engage in a variety of free and low-cost activities. Charlotte County Parks and Natural Resources Division follows the Four Pillars of the Florida Recreation and Parks Association (FRPA) and the Three Pillars of the National Recreation and Parks Association (NRPA). The Florida Recreation and Parks Association has adopted a unique strategic plan to be implemented over the next 2 to 5 years that encompasses the Four Pillars of Health, Community, Economy, and Environment. The pillar associated with health highlights the relationships between sound body and minds to healthy active lifestyles which are promoted through the development of parks. The Community pillar highlights the connections we are able to make with each other, the environment, and our place in the world through a commonplace such as a park. Florida's parks have become an essential part of the economy. The pillar for Economy demonstrates the direct influence that the development of parks has on tourism rates. Parks increases the value of housing and commercial real estate and therefore provides the infrastructure needed to accommodate revenue generating events to benefit the local and state economy. The final pillar is Environment. This pillar evokes the emotional responsibility to protect our natural resources through appreciation for its beauty. Parks provide a safe and fun way for the public to enjoy their area and engage with natural and historic treasures. The National Recreation and Parks Association present Three Pillars of values that make parks and recreation essential services to the community, which include Health and Wellness, Equity at the Center, and Conservation. Health and Wellness is achieved in parks by creating holistic and people-centered community wellness hubs. These hubs provides outlets, programs, and breaks down systemic barriers to healthy lifestyles. Equity at the Center strives to ensure that all people have equal access to parks which can be life saving and life altering programs and resources they provide. Conservation addressed one of the most pressing environmental challenges by creating protected spaces for environmental programs and sustainable practices.



Parks and preserves enhance the quality of life in Charlotte County, which is an essential building block of the strategy for economic development and community growth. There are many dimensions that factor into quality of life, such as health, environmental quality, culture and leisure, and others that can be seen in the figure. Charlotte County Community Services Parks and Natural Resources Division provides access to resources including parks and environmental lands that will improve residents and visitors' quality of life.

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Evidence is showing that people are putting more emphasis than ever before on the importance of lifestyle enhancing opportunities, than the job itself, when choosing where to live. Families and skilled workers are attracted to places with parks and preserves that offer diverse opportunities for outdoor recreation, clean air and water, and a safe and social community, all of which are offered in Charlotte County.

By providing access to an array of free and low-cost activities, such as boating, fishing, biking, exercising, exploring nature, hiking, picnicking, swimming, tennis, pickleball, walking, and wildlife viewing, parks and preserves in Charlotte County generate numerous benefits. Parks and preserves increase social capital, enhance social skills, provide recreational opportunities, improve human health, provide natural goods and services including stormwater management, filtering air pollutants, and pest control. They also attract visitors, support local jobs, boost spending at local businesses, create local tax revenue, and increase property values of surrounding areas. The remainder of this report quantifies the benefits that Charlotte County Community Services Parks and Natural Resources Division provides. This report is divided into numerous sections that cover how Charlotte County Parks and Natural Resources Division is linked to each of the Four Pillars of the FRPA and the Three Pillars of the NRPA.

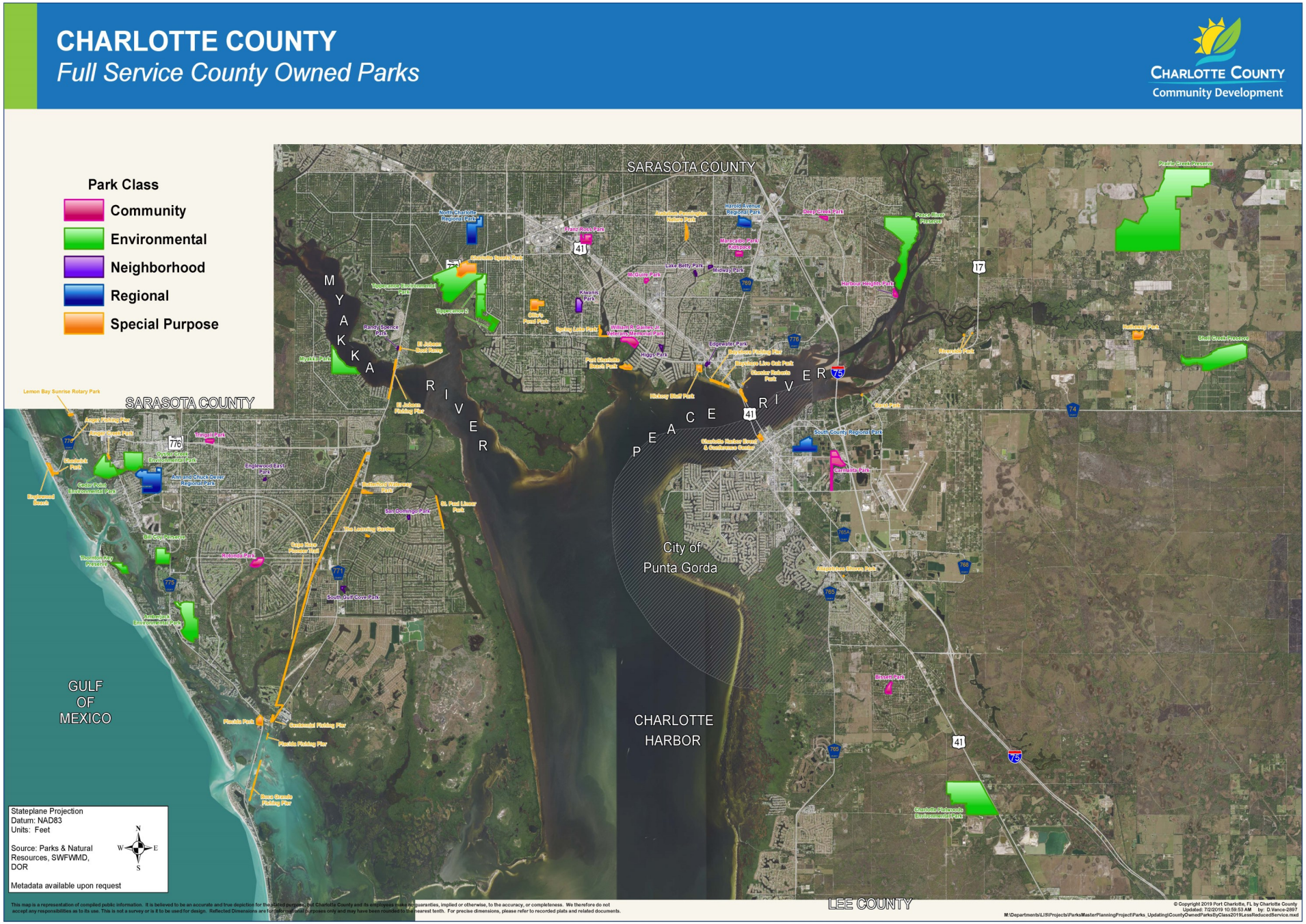
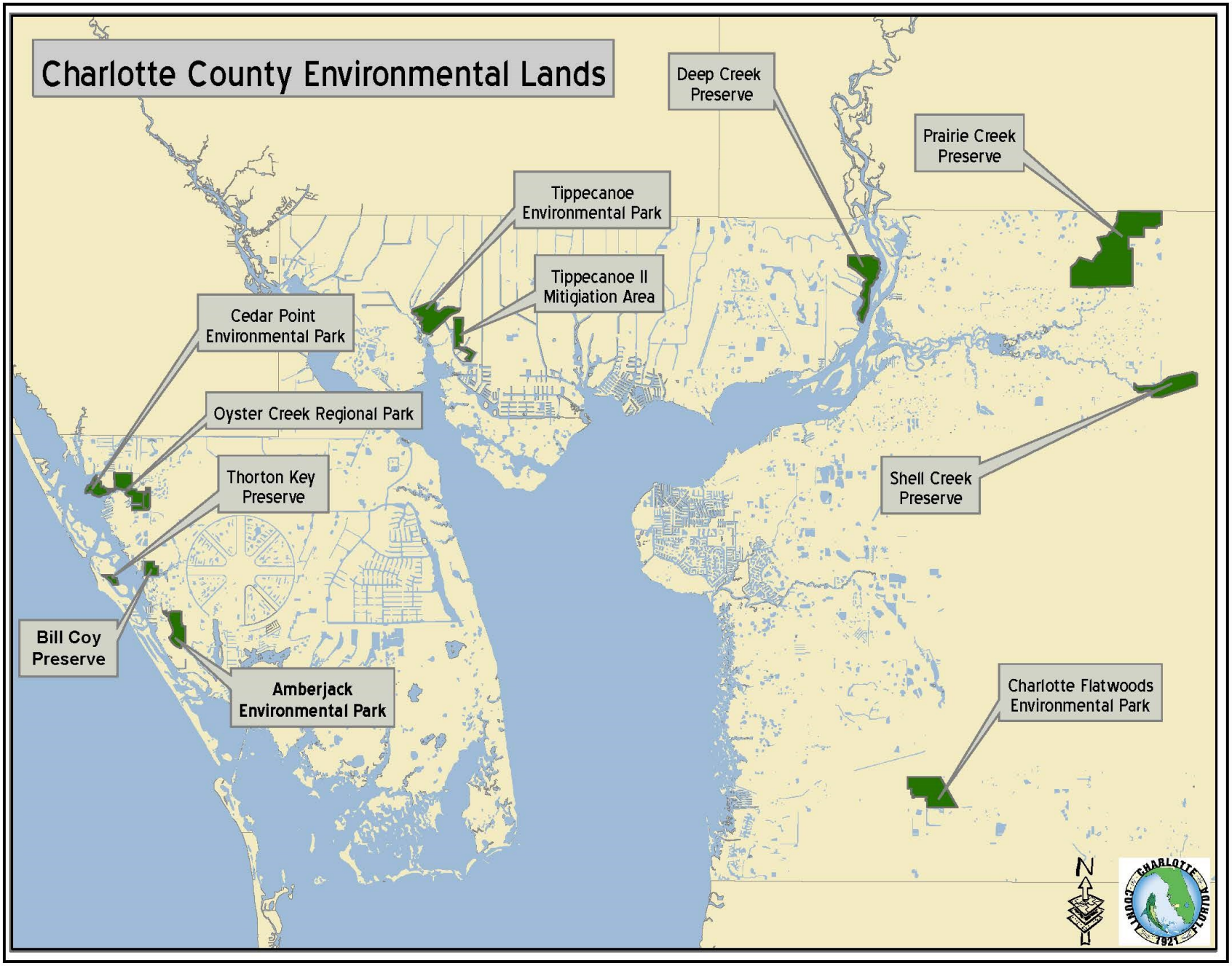


Figure 1: Location of all Charlotte County Parks (tree symbol represents the park location)


Charlotte County Environmental Lands
Deep Creek Preserve
Prairie Creek Preserve
Tippecanoe Environmental Park
Tippecanoe II Mitigation Area
Cedar Point Environmental Park
Oyster Creek Regional Park
Thorton Key Preserve
Shell Creek Preserve
Bill Coy Preserve
Amberjack Environmental Park
Charlotte Flatwoods Environmental Park
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Parks and Natural Resources Facilities

Charlotte County Community Services has many assets available that provide numerous benefits to our community. There are a total of 62 facilities spread throughout the County totaling over 5,100 acres of land. 29 of these facilities meet Americans with Disabilities Act (ADA) guidelines and are ADA accessible parks. 6 of these facilities are equipped with ADA friendly kayak launches and 6 include trails that meet ADA guidelines. Charlotte County Parks and Natural Resources continue to maintain, create, and modify the ~~facilities~~ to better meet the needs of the community by developing more programs for the community based on public input and needs, adding more ADA accessible features and accesses, and directing funds where necessary. Charlotte County Parks and Natural Resources offers a variety of opportunities for people of all ages, income levels, race, religion, gender, and physical abilities to interact, learn, and grow. Below is a list of Charlotte County parks and preserves:

- **Ainger Creek Park**
- **Allapatchee Shores Park**
- **Amberjack Environmental Park**
- **Anger Fishing Pier**
- **Ann & Chuck Dever Regional Park**
- **Audubon-Pennington Nature Park**
- **Bayshore Live Oak Park**
- **Bill Coy Preserve**
- **Bissett Park**
- **Boca Grande Fishing Pier**
- **Butterford Waterway Park**
- **Cape Haze Pioneer Trail Park**
- **Carmalita Park**
- **Cedar Point Environmental Park**
- **Centennial Fishing Pier**
- **Centennial Park**
- **Charlotte Flatwoods Environmental Park**
- **Charlotte Harbor Event & Conference Center**
- **Charlotte Sports Park**
- **Chester Roberts Park**
- **Darst Park**
- **Deep Creek Park**
- **El Jobean Boat Ramp**
- **El Jobean Fishing Pier**
- **Englewood Beach at Chadwick Park**
- **Englewood East Park**
- **Franz Ross Park**
- **G. C. Herring Park**
- **Harbour Heights Park**
- **Harold Avenue Regional Park**
- **Hathaway Park**
- **Higgs Park**
- **Katherine Ariens Dog Park**
- **Lake Betty Park**
- **Larry Taylor Kiwanis Park**
- **Lemon Bay Sunrise Rotary Park**
- **Live Oak Point**
- **Maracaibo Kidspace Park**
- **McGuire Park**
- **Midway Park**
- **Ollie's Pond Park**
- **Oyster Creek Environmental Park**
- **Peace River Preserve**
- **Placida Fishing Pier**
- **Placida Park**
- **Port Charlotte Beach Park**
- **Prairie Creek Preserve**
- **Randy Spence Park**
- **Riverside Park**
- **Rotonda Community Park**
- **San Domingo Park**
- **Shell Creek Preserve**
- **South County Regional Park**
- **South Gulf Cove Park**
- **Spring Lake Park**
- **St. Paul Linear Park**
- **The Learning Garden**
- **Thornton Key Preserve**
- **Tippecanoe Environmental Park**
- **Tippecanoe II**
- **Tringali Park**
- **William R. Gaines Jr. Veterans Memorial Park**

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Social and Community Cohesion

Social capital is defined by the Organization for Economic Cooperation and Development as “networks together with shared norms, values and understandings that facilitate cooperation within or among groups”. Parks and Natural Resources facilities are essential to building cohesive communities, increasing social capital, and improving quality of life. Numerous studies have shown that these facilities can make a community stronger, safer, and more successful.

Building a Sense of Community

Charlotte County Parks and Natural Resources Facilities are one of our counties most effective assets to change the character and improve the image of our community. Parks and preserves provide areas for people to meet and play in a safe open space, specifically designed for their enjoyment and safety. Playground equipment gives kids and parents the opportunity to socialize, build connections with each other, and create positive memories with the parks in the community. Positive memories associated with Charlotte County Parks and Natural Resources Facilities are vital in creating new and continued involvement from the community. Community involvement that has a direct impact on increasing the social capital of Charlotte County include volunteer and charity events, such as food drives, park clean ups, and run-a-thons. These events benefit the communities interaction with each other, the parks and natural resources facilities, and those who are being assisted by these events.

Encouraging Social Skills in Kids

Schools offer recess every school day and are typically 10 to 30 minutes long. This is not a lot of time for kids to socialize outside of the classroom during school periods. Charlotte County parks and natural resources facilities that are located throughout the county offer children safe spaces to meet outside of the school and learn to interact with each other. Visiting these facilities also presents the chance for kids to socialize with kids from other schools who they otherwise would not get the opportunities to play with.

Environmental Connection to Improve the Community

With technology continuing to become a bigger part of our lives, especially children's, we are more connected than ever, but sometimes not in ways that are positive. It has become common for individuals to just interact online, which is good; however, we lose the personal connection to each other and the environment this way. Nature trails and green spaces in Charlotte County allow residents to interact with the gorgeous natural habitat that attracts visitors from all around the world. Charlotte County Parks and Natural Resources Division also fosters environmental connection through implementation of environmental stewardship and community outreach programs. Such programs stimulate academic and social growth while promoting appreciation of the natural environment. Being out in nature increases the likelihood that visitors will work to conserve our valuable natural resources that make up our community for current and future generations.

Safe Space for Everyone

Charlotte County Community Services Parks and Natural Resources facilities offer numerous amenities available for people of all ages, income levels, race, religion, gender, and physical ability. A list of Charlotte County Parks and Natural Resources amenities can be found below in Table #1. Many of these amenities meet Americans with Disabilities Act (ADA) guidelines and include ADA friendly kayak launches and trails. Charlotte County Parks and Natural Resources Division works diligently to maintain facilities to ensure the safety of all visitors and continues to implement new safety measures as new developments are made.

Table #1. Charlotte County Parks and Natural Resources Amenities

Amphitheatre	Drinking Fountains	Pickleball Courts
Baseball Fields	Environmental Center	Picnic Shelters
Basketball Courts	Fishing Piers	Picnic Tables
BBQ Grills	Fitness Trails	Playground and Table Shade
Beach	Football Fields	Playgrounds
Bike Repair Stations	Historic Features	Remote Control Race Car Track
Bike Trails	Horse Arena	Restrooms
Bird Watching	Horse Shoes	Running Track
Boardwalks	Horse Trails	Shuffleboard
Boat Ramps	In line Hockey	Skate Park
Bocce Courts	Kayak Launches	Soccer Fields
Community Gardens	Lighted Sport Fields	Softball Fields
Concession Stands	Little League Fields	Splash Pads
Disc Golf	Multi Purpose Fields	Tennis Courts
Docks	Open Green Space	Unpaved Nature Trails
Dog Friendly	Outdoor Classrooms	Volleyball Courts
Dog Parks	Paved Walking Paths	Wildlife Observation Platforms

Effect on Crime Rate

According to research done by numerous researchers such as Cornell University, the presence of green spaces generally reduces crime rates in the surrounding areas. The well-maintained parks and preserves in Charlotte County provide numerous opportunities for people of all ages to invest their time in more productive, fun, and community building activities. Without the facilities offered by Charlotte County Parks and Natural Resources Division, there are fewer positive opportunities for the community to spend their time on, which can lead to an increase in the crime rate. Additionally, crime rate can be increased if facilities are not well maintained, so Charlotte County Parks and Natural Resources invest numerous resources and funds in keeping our facilities beautiful and up to date.

Despite efforts to eliminate all criminal activities within parks and natural resource facilities, crime can still happen. Crime often occurs at areas where vehicles are left unattended for extended periods of time and where groups of people gather. During 2021, a total of 5,278 arrests were made by the Charlotte County Sheriff's Office (CCSO) for various offenses in Charlotte County. Of the 5,278 arrests, 62 arrests were made at Charlotte County Parks and Natural Resources facilities. Analyzing Charlotte County crime data from the Crime Mapping Interactive Map found on the CCSO website, conclusions support the theory that properly maintained green spaces generally reduces crime rates in the surrounding areas. CCSO regularly patrols Charlotte County Parks and Natural Resources facilities to make their presence known to would be criminals and to reduce response times for facility visitors who are in need of assistance.

In addition to regular patrols from CCSO and staff, Charlotte County Community Services is implementing recommendations of a multi-disciplinary approach for crime prevention called Crime Prevention Through Environmental Design (CPTED). CPTED uses urban and architectural design and the management of built and natural environments to reduce victimization, deter offender decisions that precede criminal acts, and build a sense of community among inhabitants so they can gain territorial control of areas, reduce crime, and minimize fear of crime. CPTED is composed of four principles, which include Natural Surveillance, Natural Access Control, Territorial Reinforcement, and Maintenance and Management. The primary goal of Natural Surveillance is to keep intruders under observation. Criminals typically do not want to be seen when committing crimes so increasing the potential for witnesses may deter intruders in addition to keeping them under observation. Natural Surveillance is achieved by adding lighting, removing obstructions to increase sight lines from within buildings, and channeling visitor activity towards potential crime areas. Directing the flow of activities towards potential crime areas increase the number of potential witnesses to crime and should deter criminals. Natural Access Control is obtained by properly placing entrances, exits, fencing, landscaping and lighting to subtly direct foot and vehicular traffic in ways that decreases criminal opportunities. Territorial Reinforcement relies on creating a sense of community by using physical elements such as fences, pavement treatment, art, signs, good maintenance, and landscaping to define a boundary between public and private areas. This clear boundary increases the chances of identifying intruders because of users' familiarity with each other and the surround area. Maintenance and Management mirrors numerous studies that conclude crime rate can be increased if facilities are not well maintained. The more dilapidated an area, the more likely it is to attract crime and other unwanted activities. This principle emphasizes the need to consider maintenance and management during the design stage as materials and finish will require maintenance that must be sustained overtime in order to reduce crime. An example includes limiting plant materials that will result in sight line obstructions.

Promotion of Health and Wellness

Benefits on Physical Health and Performance

The Centers for Disease Control and Prevention recommends that children and adolescents perform a minimum of 60 minutes of physical activity each day and that adults perform a minimum of 150 minutes of aerobic activity each week. According to the data from the World Health Organization, globally, 1 in 4 adults and more than 80 percent of adolescents do not meet the recommended levels of physical activity. People who do not meet recommended physical activity minimums have a 20 to 30 percent increased risk of death compared to people who are sufficiently active. Parks and preserves provide the opportunity for citizens to control their weight, strengthen their bones and muscles, and reduce their risk of cancers, cardiovascular diseases, and type-2 diabetes, as well as numerous other health benefits.

Having safe access to areas designed for physical activity, encourages community residents and visitors to participate in physical activity. Charlotte County Parks and Natural Resources Division encourages a healthy and active lifestyle by providing access to parks and trails throughout the geographical area of Charlotte County. Access and repeated use of facilities is encouraged by having parks and preserves within a short distance of homes and ensuring routes to facilities are safe. Charlotte County Parks and Natural Resources Division build, maintain, and update multi-use paths, playgrounds, walking trails, open green spaces, and all other components that make up our beautiful facilities to encourage repeated use for physical activity and satisfaction from all visitors.

Benefits on Mental Health and Performance

Parks and preserves improve the mental health and mood of visitors. Participating in physical activities and being outdoors in nature has been shown to help individuals fight against and reduce mental health issues such as stress, anxiety, and depression. Being in nature can also increase your sense of balance, self-esteem, and connection to your community.

Multiple logistic regression analyses have been performed to investigate the association between distance between green space and self-perceived stress. Results show that residents living more than a half mile away from a green space have nearly 50 percent higher odds of experiencing stress than those living less than 1,000 feet from a green space. Test respondents who did not report stress had more than 50 percent higher odds of visiting a green space at least a few days a week than those reporting stress. Results from the analysis also showed that the more often respondents visited green spaces, the less stress they experienced.

Charlotte County Community Services has a total of 62 facilities spread throughout the County totaling over 5,100 acres of land. The majority of these facilities are located within residential communities, so residents in have access to stress reducing green spaces throughout the County.

For developing kids, playing outside instead of indoors has risen to such high levels of importance that doctors prescribe time outdoors, as outdoor activity has positive effects on their test scores, cognitive function, behavior, self-discipline, and reduces signs of ADHD. Although schools offer essential learning opportunities to children, not every child learns as efficiently in that setting. Charlotte County Community Services offer hands-on learning opportunities outside of the classroom for kids to learn while having fun. Learning in and outside of the classroom can create a large bubble of education for children to learn and develop in a way that helps them reach their potential.

Economic Boost

Charlotte County is seeing record tourism numbers, according to the latest data from state and tourism partners. Charlotte County set a monthly record with **$468,992** of tourism development tax collections in May 2021, which is an increase from May 2019 and May 2020 of 102% and 195%, respectfully. From January to May of 2021, collections are up 25.5% versus 2019 and 30.6% over 2020.

Charlotte County Parks and Natural Resources Division provides safe spaces for the community to host revenue generating events and boost tourism which benefit the local and state economy. Charlotte County Community Services assets include a large amount of waterfront and environmentally protected properties available for boating, kayaking/canoeing, bird watching, fishing, hiking, sunset/sunrise watching, beach fun, and other environmental activities. These activities greatly attract both local and non-local visitors.

Enhanced Property Values

Distance from parks and preserves is known to influence property values. Nationwide research shows that the premium for proximity to these spaces can affect market values up to 2,000 feet by 8% to 20%. Parks and natural resource areas can also lead to proportionately higher property tax revenues for local governments. The real estate market consistently demonstrates that people are willing to pay more for a house close to a park due to the many desirable assets that parks and preserves provide. These desirable assets include an improved view from homes, proximity to playgrounds and large open grassy spaces, proximity to prime biking, walking, and nature watching locations, and increased socialization opportunities.

The Florida Parks and Recreation Association Impact Calculator was used to calculate the increased value of nearby homes based on the proximity affect. The number and market value of homes within 2,000 feet from Charlotte County parks and preserves was collected and a conservative 3.3% proximity effect value was used for final calculations. This value was calculated by looking at the impacts of parks on home prices within 2,000 feet of the parks and the prices of homes outside of this range and was determined to be less than Dr. John Crompton's proximity principle estimate of 5%. The result of this calculation concluded that homes within 2,000 feet from Charlotte County parks and preserves can have an increase home value of **$7,000-$8,000 each.**

Funding from Visitors

Although most of Charlotte County parks and preserves have free admission or a minimal parking fee, they play a significant role in the tourism economy. Visitors attracted to Charlotte County by their facilities often end up spending considerable amounts of money on food, entertainment, fuel, gifts, lodging, and other local assets.

During the 2021 fiscal year, 863,000 individuals visited Charlotte County. Visitor spending in Charlotte County generated a total economic impact of $844,435,500. This economic impact supported 10,752 local jobs and generated $248,251,200 in local wages and salaries. Additionally, each household in Charlotte County saved $875 in taxes as a result of tourism.

Charlotte County Community Services offers numerous opportunities for visitors to participate in a wide variety of activities. A list of upcoming events and the estimated economic impact of each can be found below in Table #2.

Table #2. Estimated Economic Impact of Sporting Events at County Facilities During Fiscal Year 2021-2022

Tournament	Location	Number of Participants	Estimated Economic Impact
SWFL Hoops- Fall Showcase	CP/HA/SC	276	$132,482
Florida Half Century Softball - The Duel(50+)	CP	455	$348,954
USA Softball Florida - Fall Bash (CXL)	CP		
USSA ProStyle Baseball - Victory in Pink	CBMX	1026	$611,708
PCHS - Class 2A Region 4 HS Swim Meet	CP	210	$80,329
USSSA Prostyle Baseball-Sunshine Classic	CSP/SC	806	$745,828
Englewood Beach WaterFest	Eng Bch	483	$5,100,000
Horizon Gymnastics- Riverfront Classic	EC	350	$522,236
SWFL Hoops - Florida Aces Showcase	CP, HA	231	$196,927
Milligan University	CP	40	$140,133
George Fox University	AD	35	$89,749
New Jersey Race Club - Swim Team Training	CP	45	$125,269
Hope College- Dive & Swim Team Training	CP	70	$266,396
SUBTOTALS		**4,450**	**$8,360,011**

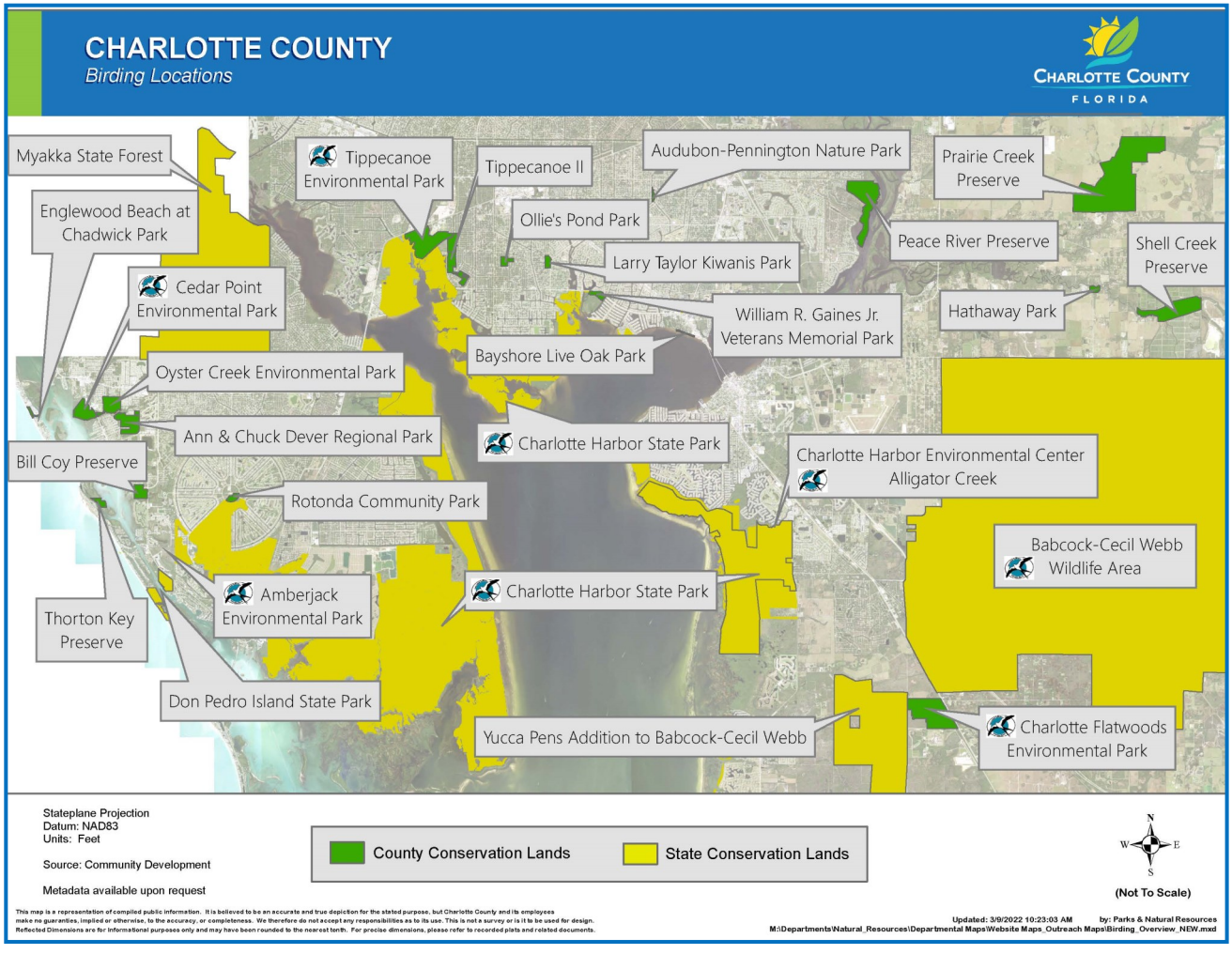
AD - Ann & Chuck Dever Regional Park
CBMX - Charlotte BMX Park
CP - Centennial Park
CSP - Charlotte Sports Park
EC - Charlotte Harbor Event and Conference Center
Eng Bch - Englewood Beach
HA - Harold Avenue Regional Park
SC - South County Regional Park

Ecotourism

Ecotourism as defined by The International Ecotourism Society is responsible travel to natural areas that conserve the environment, sustains the well-being of the local people, and involves interpretation and education. Charlotte County has numerous environmental resources available that attract visitors who travel to the County with the purpose of environmental exploration, conservation, and education. Three of the most popular ecotourism activities in Charlotte County include birding, visiting the artificial reefs, and padding along the Blueway Trail system.

Birding

Charlotte County's Environmental Parks and Preserves provides habitat for a diverse assortment of bird species. Many of the parks and preserves are along the Great Florida Birding Trail which is a network of 510 premier wildlife viewing sites across the state. The County's diverse population of birds includes the Northern Bobwhite, Sandhill Crane, Bald Eagle, Reddish Egret, Purple Gallinule, Red-shouldered Hawk, Green Heron, Florida Scrub-Jay, Belted Kingfisher, Swallow-tailed Kite, Yellow-crowned Night-heron, Burrowing Owl, American Oystercatcher, White Pelican, Snowy Plover, Yellow-bellied Sapsucker, Black Skimmer, Bachman's Sparrow, Roseate Spoonbill, Black-necked Stilt, Wood Stork, Royal Tern, White-eyed Vireo, Pine Warbler, Pileated Woodpecker, Red-cockaded Woodpecker, Red-headed Woodpecker. Birding is a hobby that is enjoyed by both novice and experienced birders, and only requires binoculars and a bird field guide for bird identification.



Artificial Reefs

Charlotte County's eight artificial reefs are famous for the massive number of diverse aquatic life that inhabit them. The wrecks and artificial reefs are covered with many soft and hard corals that attract small and large species such as snappers, goliath and gag grouper. These resources also attract divers year-round as the weather and water visibility provide consistently great diving conditions. In addition to current aquatic life, our reefs are rich with evidence of past life. Shark teeth, including the teeth of the extinct Megalodon shark, can be found when diving at Charlotte County's reefs.

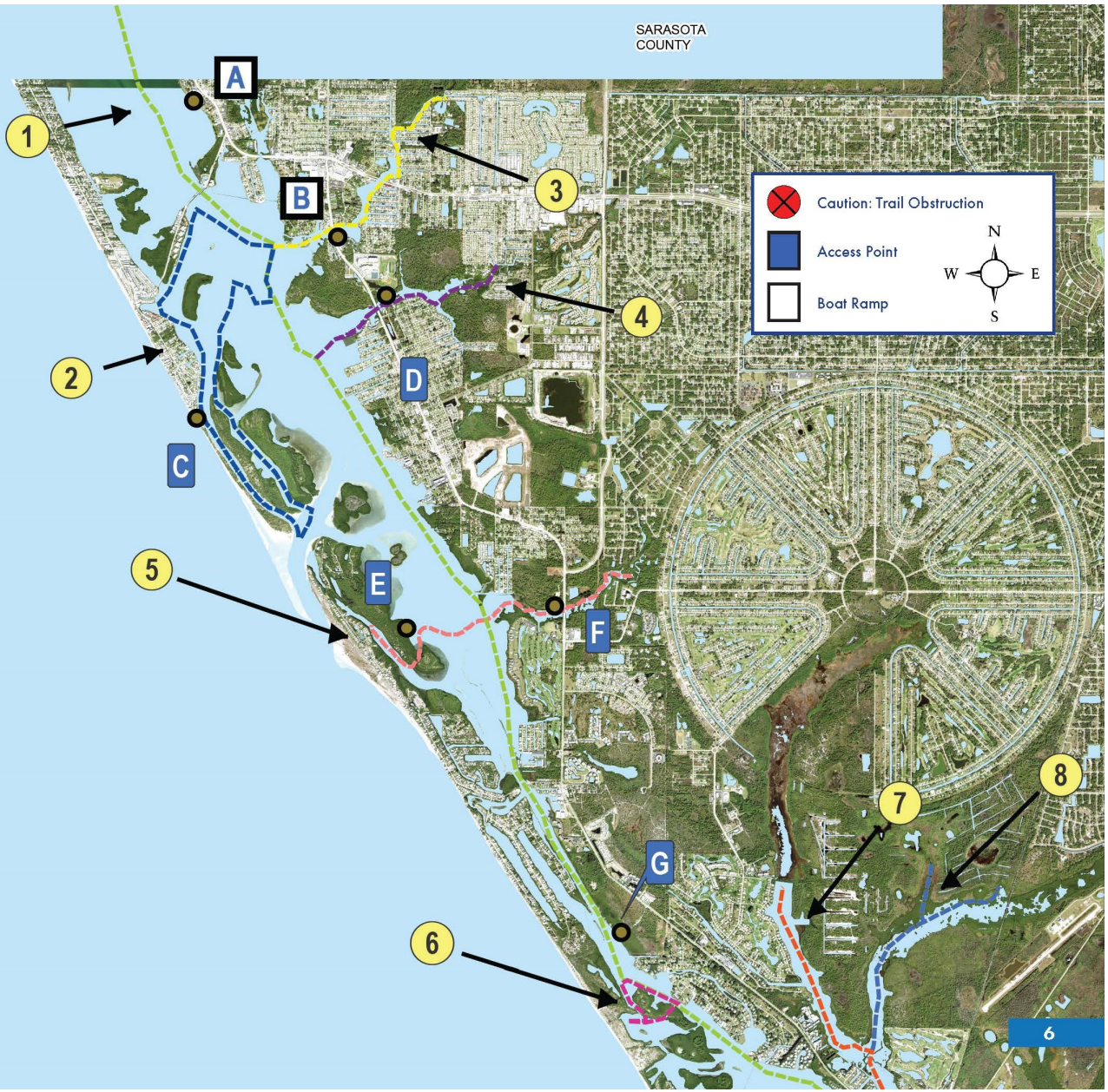
Charlotte County Blueway Trail System

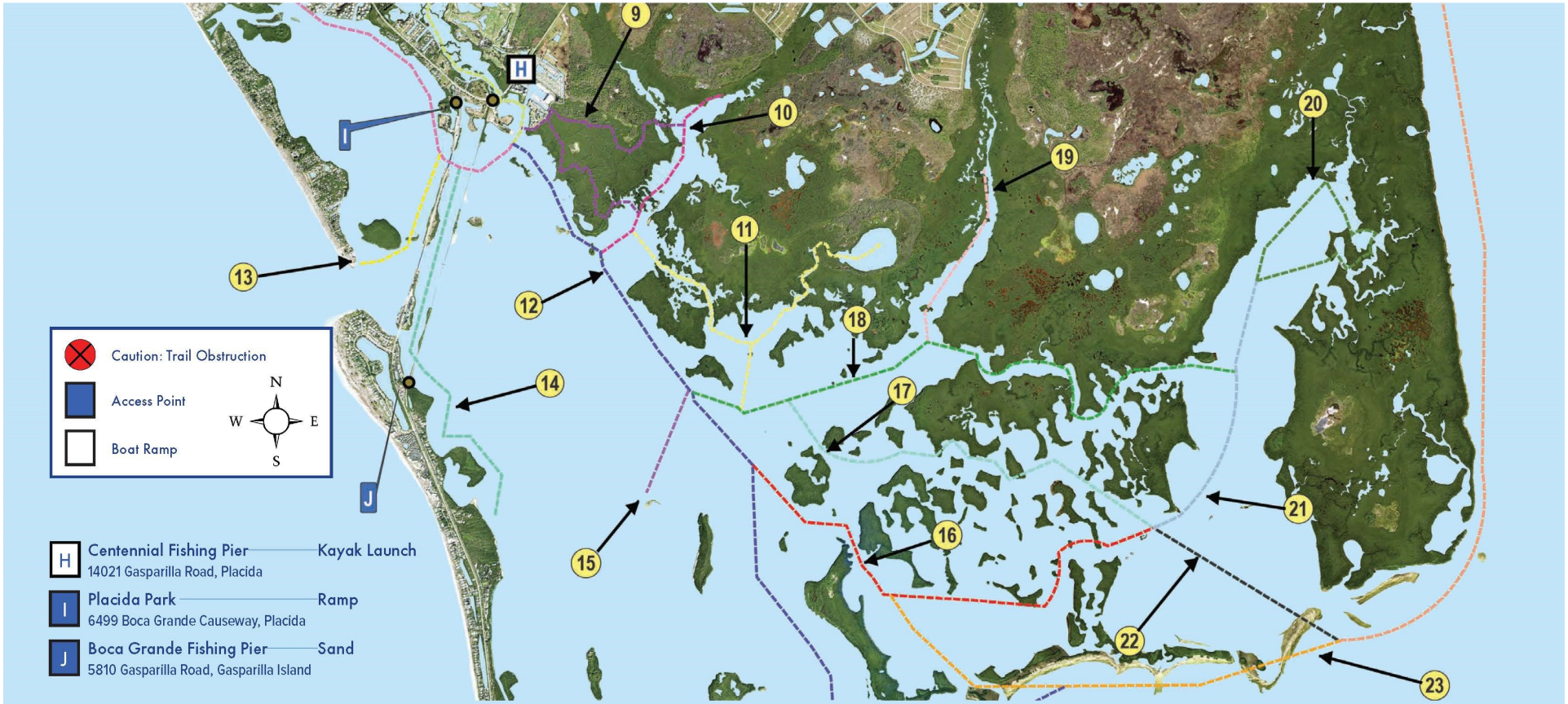
Visitors escape the fast pace of day-to-day life by paddling through the state recognized Charlotte County Blueway Trails system. The trail system runs approximately 219 miles and includes waterways that allow beginner, intermediate, and experienced paddlers to safely enjoy the coastal habitats. The coastal habitats include Seagrasses, Salt Marshes, Mangrove Forests, and Riverine communities. The waterways can be accessed at any of the 30 access points available in Charlotte County, most of which have no parking and launching fees. Like Charlotte County's artificial reefs, the Charlotte County Blueway Trail System attracts visitors year-round due to an average annual temperature of 74.8 degrees Fahrenheit and natural barriers that create typically calm water conditions for paddling.

West County Trails

1. Inter Coastal Trail (BEG)
2. Stump Pass Trail (BEG)
3. Rocky Creek Trail (INT)
4. Oyster Creek Trail (BEG)
5. Buck Creek Trail (BEG)
6. Rambler Hole Trail (BEG)
7. Grande Tour Trail (BEG)
8. Coral Creek East Trail (BEG)

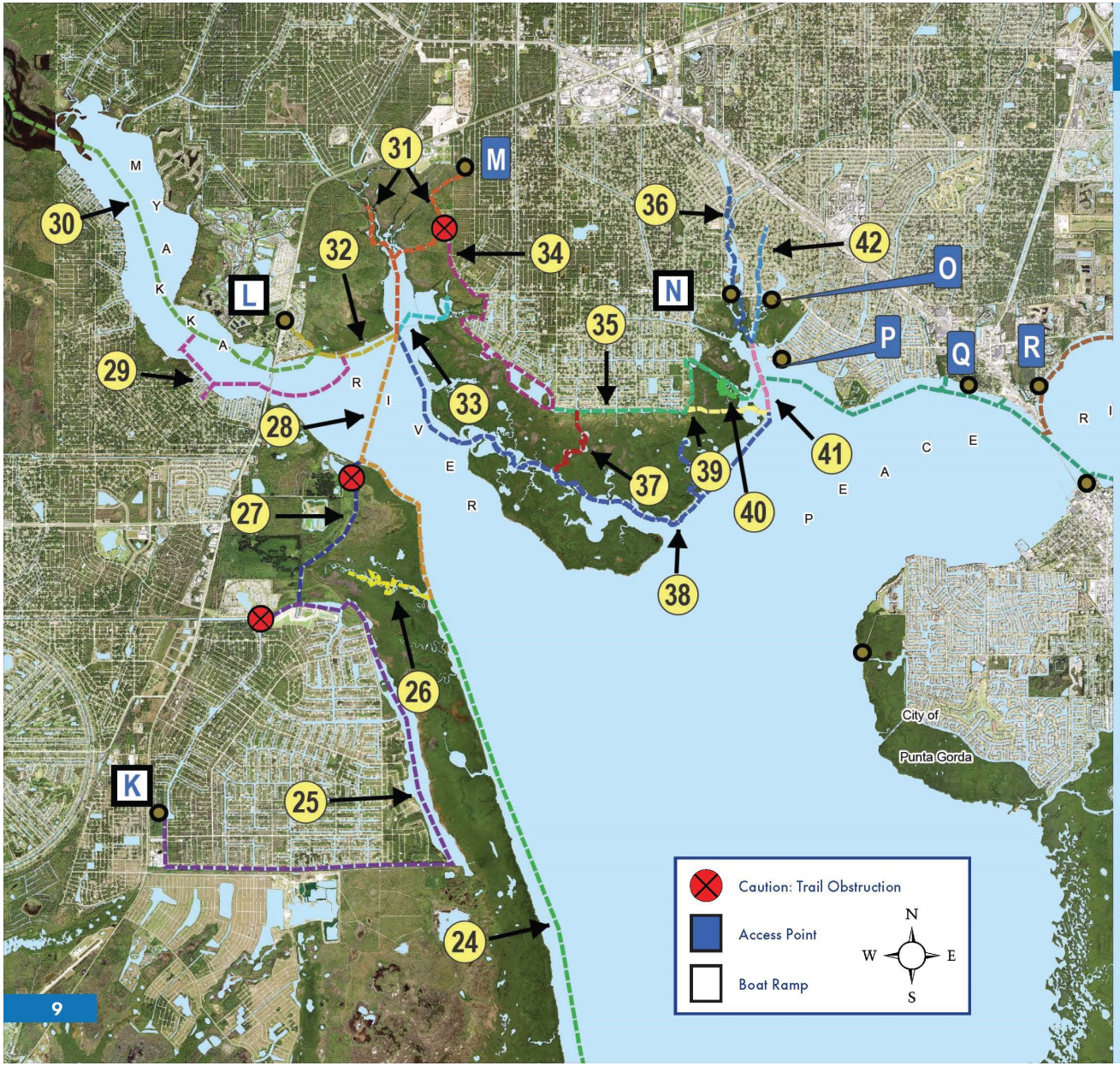
A	Lemon Bay Sunrise Rotary 1000 S McCall Road, Englewood	Ramp
B	Ainger Creek Park 2011 Placida Road, Englewood	Ramp
C	Stump Pass Beach State Park 900 Gulf Blvd., Englewood	Beach
D	Oyster Creek Environmental Park 2333 Placida Road, Englewood	Sand
E	Thorton Key Preserve 8 Thornton Key Preserve, Englewood	Sand
F	Bill Coy Preserve 5350 Placida Road, Englewood	Geoweb
G	Don Pedro State Park 8450 Placida Road, Placida	Sand





West County Trails

- 9 Woolverton Trails (BEG)
- 10 Catfish Creek Trail (BEG)
- 11 Boggess Hole Trail (BEG)
- 12 M Cantelas Trail (BEG)
- 13 Little Gasparilla Trail (BEG)
- 14 Boca Grande Trail (BEG)
- 15 Bird Key Trail (BEG)
- 16 Bull Bay Trail (BEG)
- 17 Bull Bay Bypass (BEG)
- 18 Shallow Water Trail (BEG)
- 19 Widden Creek Trail (BEG)
- 20 Sister Ponds Trail (BEG)
- 21 Turtle Bay Trail (BEG)
- 22 Turtle Bay Bypass (BEG)
- 23 Cantelas Trail (BEG)



Mid-County Trails

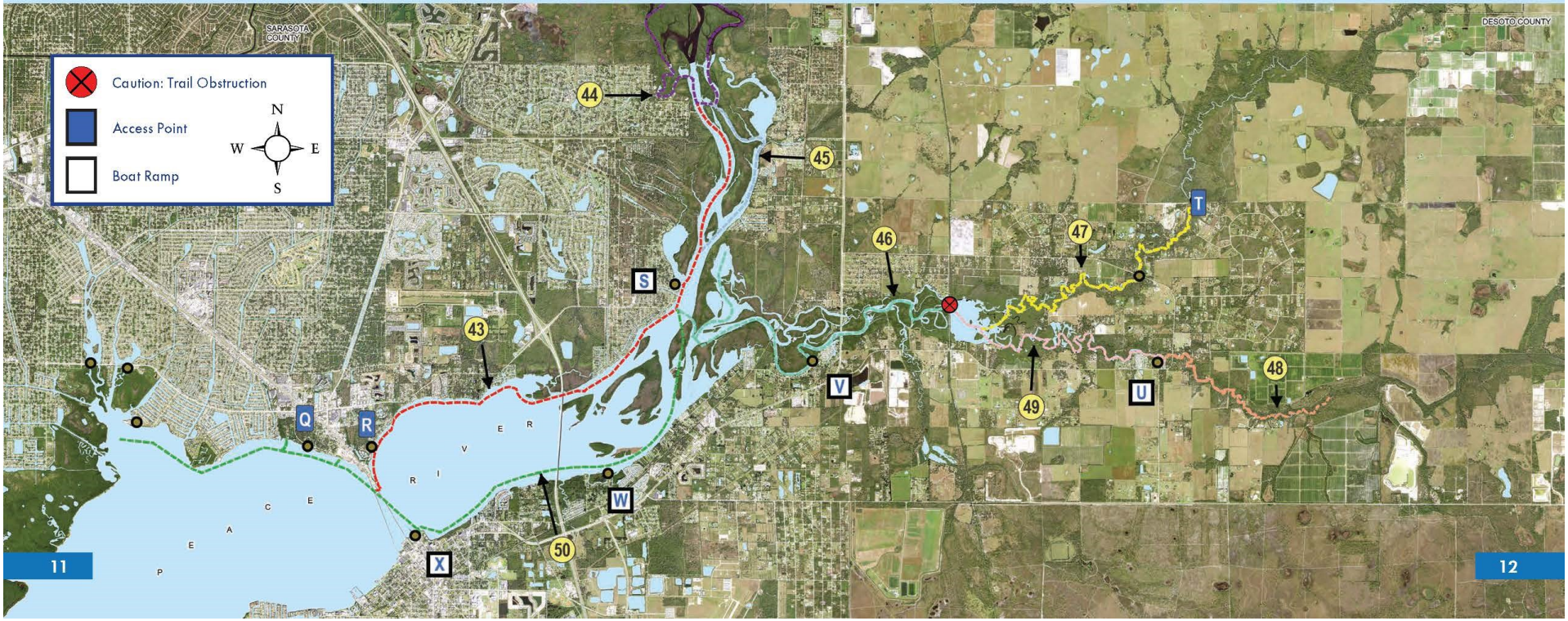
- 24 West Wall Trail (EXP)
- 25 Santa Fe Trail (BEG)
- 26 Trout Creek Trail (INT)
- 27 Cattle Dock Trail (BEG)
- 28 Upper West Wall Trail (INT)
- 29 Gulf Cove Trail (INT)
- 30 Myakka River Trail (INT)
- 31 Tippecanoe Trail (BEG)
- 32 Ghost Point Trail (BEG)
- 33 Muddy Cove Trail (BEG)
- 33 Muddy Cove Trail (BEG)
- 34 Ohara Trail (BEG)
- 35 Arapahoe Trail (BEG)
- 36 W Spring Lake Trail (BEG)
- 37 Three Lakes Trail (BEG)
- 38 Myakka Cut Off (INT)
- 39 Muddy Cove Cut (BEG)
- 40 Lewis Creek Trail (BEG)
- 41 Alligator Bay Trail (BEG)
- 42 E Spring Lake Trail (BEG)

- K **South Gulf Cove Park** — Ramp
  10150 Amicola St., Port Charlotte
- L **El Jobean Boat Ramp** — Ramp
  4224 El Jobean Road, Port Charlotte
- M **Tippecanoe Environmental Park** — Sand
  2400 El Jobean Road, Port Charlotte
- N **Spring Lake Park** — Ramp
  3520 Lake View Blvd., Port Charlotte
- O **William R. Gaines Veterans Jr. Memorial Park** — Sand
  20499 Edgewater Drive, Port Charlotte
- P **Port Charlotte Beach Park** — Beach
  4500 Harbor Blvd., Port Charlotte
- Q **Bayshore Live Oak Park** — Sand
  23157 Bayshore Road, Port Charlotte
- R **Chester Roberts Park** — Sand
  5084 Melbourne St., Punta Gorda

Mid-County Trails

43 Harbour Heights Trail (BEG)
44 Long Lake Trail (BEG)
45 South Long Lake Trail (BEG)
46 Outer Shell Creek Trail (BEG)
47 Prairie Creek Trail (BEG)
48 Upper Shell Creek Trail (INT)
49 Shell Creek Trail (INT)
50 Tranquility Island Trail (BEG)

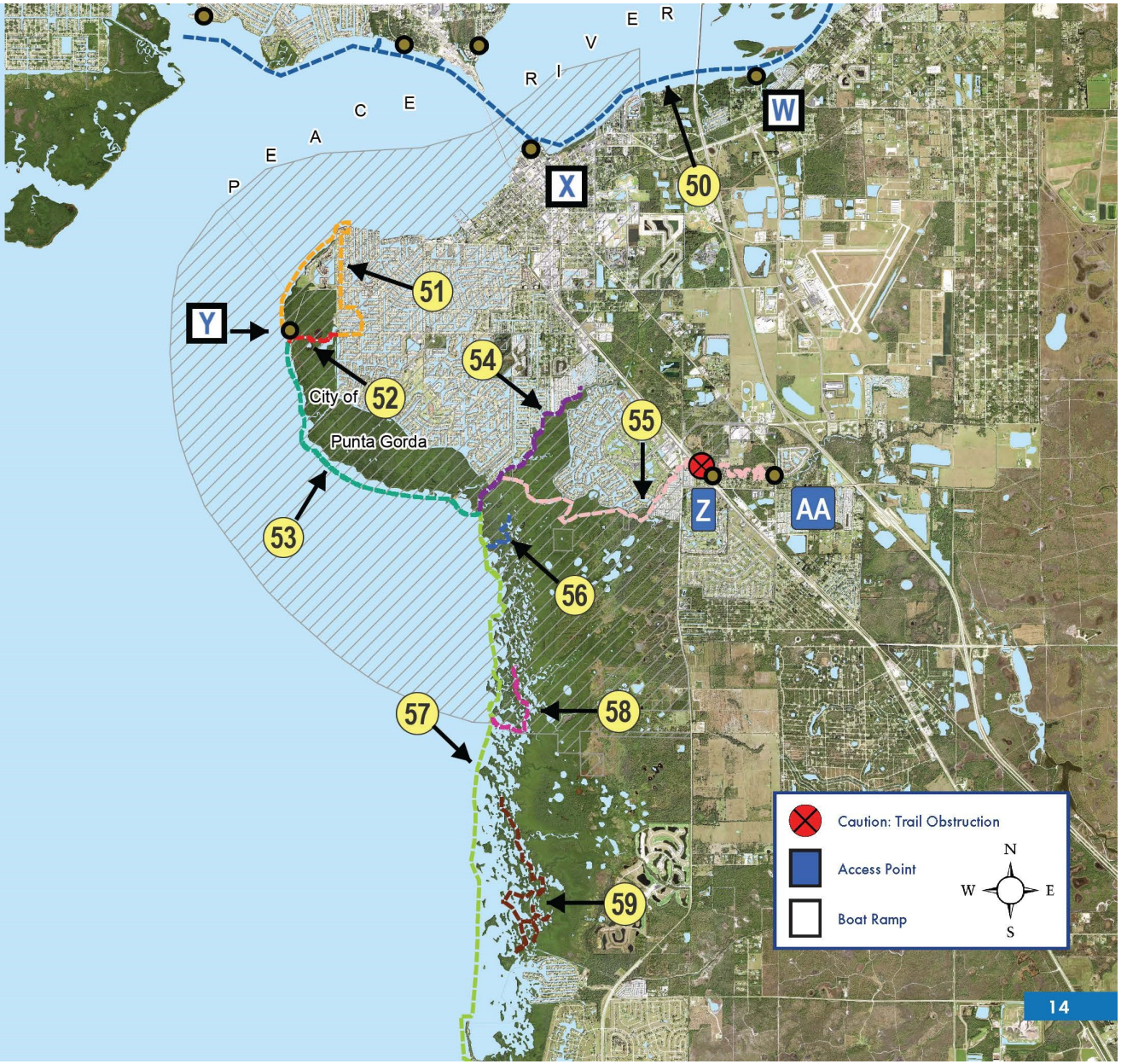
Q	Bayshore Live Oak Park 23157 Bayshore Road, Port Charlotte	Sand	
R	Chester Roberts Park 5084 Melbourne St., Punta Gorda	Sand	
S	Harbor Heights Park 27420 Voyageur Drive, Punta Gorda	Ramp	
T	Praire Creek Preserve Access 1900 Duncan Road, Punta Gorda	ROW	
U	Hathaway Park 35461 Washington Loop Road, Punta Gorda	Ramp	
V	Riverside Park 8120 Riverside Drive, Punta Gorda	Ramp	
W	Darst Park 537 Darst Ave., Punta Gorda	Ramp	
X	Laishley Park Municipal Marina 120 Laishley Ct., Punta Gorda	Ramp	



South County Trails

- 50 Tranquility Island Trail (BEG)
- 51 Dead Lake Trail (INT)
- 52 Barge Canal Trail (INT)
- 53 Explorer Trail (INT)
- 54 North Fork Trail (BEG)
- 55 Alligator Creek Trail (BEG)
- 56 Gaspar Trail (INT)
- 57 East Wall Trail (EXP)
- 58 Mosquito Trail (INT)
- 59 Spider Trail (INT)

W	Darst Park 537 Darst Ave., Punta Gorda	Ramp
X	Laishley Park Municipal Marina 120 Laishley Ct., Punta Gorda	Ramp
Y	Ponce de Leon Park 3400 Ponce de Leon Pkwy, Punta Gorda	Ramp
Z	Allaptchee Shores Park 3100 Hickory Ct., Punta Gorda	Ramp
AA	Taylor Rd. Access Taylor Road, Punta Gorda	Roadside



Charlotte County Blueway Trail System
Trailhead Access Points

ID	Facility	Access Type	Condition	Food	Water	Restrooms	Parking Fee	Launch Fee
A	Middle Beach Manasota Key Dr.; Englewood	Ramp	Good	No	No	Yes	No	No
B	Indian Mound Park 210 Winson Ave.; Englewood	Beach	Good	No	No	Yes	No	No
C	Lemon Bay Sunrise Rotary Park 1000 SMcCall Rd.; Englewood	Ramp	Good	No	No	Yes	Yes	No
D	Ainger Creek Park 2025 Placida Rd.; Englewood	Ramp	Good	No	No	Yes	Yes	No
E	Oyster Creek Environmental Park 2333 Placida Rd.; Englewood	Sand	Good	No	No	No	No	No
F	Stump Pass State Park Manasota Key Rd.; Englewood	Beach	Good	No	No	Yes	Yes	No
G	Bill Coy Preserve 5400 Placida Rd.; Englewood	Muck	Fair	No	No	No	No	No
H	Thorton Key Englewood	Sand	Good	No	No	No	No	No
I	Placida Park 6499 Gasparilla Rd.; Placida	Ramp	Good	No	No	Yes	Yes	No
J	Uncle Henry's Marina 5800 Gasparilla Rd.; Boca Grande	Ramp	Fair	No	Yes	Yes	No	Yes
K	Boca Grande Fishing Pier 5810 Gasparilla Rd.; Placida	Sand	Fair	No	No	Yes	No	No
L	South Gulf Cove Park 10150 Amicola St.; Port Charlotte	Ramp	Good	No	No	Yes	Yes	No
M	El Jobean Boat Ramp 4224 El Jobean Rd.; El Jobean	Ramp	Good	No	No	Yes	Yes	No
N	Tippecanoe Environmental Park 2300 El Jobean Rd.; Port Charlotte	Grass	Good	No	No	No	No	No
O	Spring Lake Park 20080 Edgewater Dr.; Port Charlotte	Ramp	Good	No	No	Yes	Yes	No
P	Sunrise Park 20499 Edgewater Dr.; Port Charlotte	Sand	Good	No	Yes	Yes	No	No
Q	Port Charlotte Beach Park 4500 Harbor Blvd.; Port Charlotte	Beach	Good	No	Yes	Yes	Yes	No
R	Bayshore Live Oak Park 22976 Bayshore Rd.; Charlotte Harbor	Sand	Fair	No	Yes	Yes	No	No
S	Chester Roberts Park 5084 Melbourne St.; Port Charlotte	Sand	Good	No	No	No	No	No
T	Harbor Heights Park 27420 Voyageur Dr.; Harbor Heights	Ramp	Good	No	Yes	Yes	Yes	No
U	Nav-a- Gator Grill 9700 SW Riverview Ct.; Arcadia	Ramp	Good	Yes	Yes	Yes	-	Yes
V	Prairie Creek Preserve East of U.S.17 North of Washingotn Loop Rd.; Punta Gorda	Sand	Good	No	No	No	No	No
W	Hathaway Park 35461 Washington Loop Rd.; Punta Gorda	Ramp	Good	No	No	Yes	Yes	No
X	Riverside Park 8320 Riverside Dr.; Punta Gorda	Ramp	Good	No	No	No	No	No
Y	Darst Park 537 Darst Ave.; Punta Gorda	Ramp	Good	No	No	No	No	No
Z	Laishely Park 100 Nesbit St.; Punta Gorda	Ramp	Good	Yes	Yes	Yes	No	No
AA	Ponce de Leon Park 4000 W. Marion Ave.; Punta Gorda	Ramp	Good	No	Yes	Yes	No	No
BB	Allapatchee Shores Park 3100 Hickory Ct.; Punta Gorda	Ramp	Good	No	No	No	No	No
CC	Taylor Rd. Access Taylor Rd.; Punta Gorda	Roadside	Poor	No	No	No	No	No
DD	Don Pedro State Park 8450 Placida Rd.; Cape Haze	Sand	Good	No	No	No	Yes	No

Charlotte County Blueway Trails

Numb	Trail Name	Region	Length	Difficulty	Access	Scenic	Overall Rating
1	Bird Key Trail	West County	.8 miles	Novice	Good 7	Wild 9	8
2	Boca Grande Trail	West County	3 miles	Novice	Good 7	Wild/Dev 8	7
3	Boggess Hole Trail	West County	3.4 miles	Novice	Good 8	Wild 8	9
4	Buck Creek Trail	West County	2 miles	Novice	Good 8	Wild 8	9
5	Bull Bay Bypass	West County	4.9 miles	Novice	Good 8	Wild 9	9
6	Bull Bay Trail	West County	3.3 miles	Novice	Good 8	Wild 9	9
7	Gallagher Trail	West County	3.6 miles	Novice	Good 6	Wild 9	7
8	Catfish Creek Trail	West County	1.6 miles	Beginner	Good 8	Wild 8	8
9	Cattle Dock Trail	West County	1.3 miles	Intermediate	Good 6	Open 7	6
10	Grande Tour Trail	West County	2.8 miles	Beginner	Very Good 9	Dev 6	7
11	Coral Creek Trail	West County	1.6 miles	Beginner	Very Good 9	Dev 6	8
12	Inter Coastal Trail	West County	18.3 miles	Novice	Fair 4	Open/Dev 6	6
13	Little Gasparilla Trail	West County	1.1 miles	Novice	Good 7	Dev 6	7
14	Cayo Palau Trail	West County	7 miles	Novice	Good 7	Wild/Dev 7	7
15	Oyster Creek Trail	West County	1.7 miles	Beginner	Fair 4	Wild/Dev 6	5
16	Rock Creek Trail	West County	1.3 miles	Beginner	Good 6	Wild/Dev 5	5
17	Santa Fe Trail	West County	11 miles	Beginner	Poor 5	Wild/Dev 7	6
18	Shallow Water Trail	West County	2.9 miles	Novice	Good 8	Wild 9	9
19	Sister Ponds Trail	West County	2.7 miles	Novice	Good 8	Wild 9	9
20	Tour Trail	West County	2.2 miles	Beginner	Very Good 8	Very Good 8	8
21	Trout Creek Trail	West County	1.7 miles	Intermediate	Good 8	Wild 8	7
22	Turtle Bay Trail	West County	4.5 miles	Novice	Very Good 9	Very Good 9	9
23	West Wall Trail	West County	12.7 miles	Expert	Good 6	Wild 9	8
24	Whidden Trail	West County	3.9 miles	Novice	Good 7	Wild/Dev 8	9
25	Widden Creek Trail	West County	3.9 miles	Novice	Good 8	Wild 9	9
26	Woolverton Trail	West County	3.2 miles	Novice	Good 8	Wild 9	9
27	Arapahoe Trail	Mid County	5.2 miles	Beginner	Good 5	Wild/Dev 8	6
28	Deep Creek Trail	Mid County	1.9 miles	Novice	Good 8	Wild 9	9
29	East Spring Lake Trail	Mid County	1.5 miles	Beginner	Very Good 9	Wild/Dev 8	8
30	Ghost Point Trail	Mid County	1.6 miles	Novice	Good 6	Dev 9	7
31	Gulf Cove Trail	Mid County	3 miles	Intermediate	Good 7	Open/Dev 6	6
32	Harbor Heights Trail	Mid County	8.7 miles	Novice	Good 8	Wild/Dev 9	8
33	Lewis Creek Trail	Mid County	.7 miles	Novice	Good 6	Wild 8	6
34	Long Lake Trail	Mid County	8.9 miles	Novice	Good 5	Wild/Dev 8	9
35	Muddy Cove Cut	Mid County	1 miles	Novice	Good 7	Wild 7	7
36	Muddy Cove Trail	Mid County	1.1 miles	Novice	Good 6	Dev 9	7
37	Myakka Cut Off	Mid County	8 miles	Intermediate	Good 8	Wild 8	8
38	Myakka River Trail	Mid County	14.3 miles	Intermediate	Poor 5	Dev 7	6
39	Sasha's Trail	Mid County	2.7 miles	Novice	Good 6	Wild 8	8
40	Spring Lake Trail	Mid County	.9 miles	Beginner	Very Good 8	Dev 7	7
41	Three Lakes Trail	Mid County	1.2 miles	Novice	Good 8	Wild 5	8
42	Tippecanoe Trail	Mid County	2.8 miles	Novice	Fair 5	Wild 9	8
43	Tranquility Island Trail	Mid County	10.3 miles	Novice	Good 7	Wild/Dev 7	7
44	West Spring Lake Trail	Mid County	2.3 miles	Beginner	Very Good 9	Wild/Dev 8	8
45	Alligator Creek Trail	East County	4.8 miles	Novice	Fair 6	Wild/Dev 9	7
46	Barge Canal Trail	East County	.6 miles	Intermediate	Very Good 9	Wild 8	8
47	Dead Lake Trail	East County	3.1 miles	Intermediate	Very Good 9	Open/Dev 6	7
48	East Wall Trail	East County	8.3 miles	Expert	Poor 4	Wild 9	7
49	Explorer Trail	East County	2.4 miles	Intermediate	Poor 6	Wild/Dev 7	7
50	Gaspar Trail	East County	.7 miles	Intermediate	Poor 4	Wild 9	7
51	Mosquito Trail	East County	1.2 miles	Intermediate	Poor 4	Wild 9	7
52	North Fork Trail	East County	1.9 miles	Novice	Fair 5	Wild/Dev 6	7
53	Outer Shell Creek Trail	East County	7.4 miles	Novice	Good 8	Wild 8	8
54	Prairie Creek Trail	East County	6.1 miles	Novice	Good 7	Wild 9	8
55	Shell Creek Trail	East County	4.1 miles	Intermediate	Good 8	Wild 9	8
56	Spider Trail	East County	3.4 miles	Intermediate	Poor 4	Wild 9	7
57	Upper Shell Creek Trail	East County	2.2 miles	Intermediate	Good 8	Wild 9	9

Economic Benefit of the Scrub-Jay Habitat Conservation Plan

The Charlotte County Scrub-Jay Habitat Conservation Plan (HCP) was developed as part of an application for an Incidental Take Permit (ITP) to address construction and development related impacts within the County to the Florida Scrub-Jay (*Aphelocoma coerulescens*) and Eastern indigo snake (*Drymarchon corais couperi*) which are state and federally threatened species. This action was triggered by a 1991 letter to Charlotte County from USFWS which indicated that the County contained habitat that could be occupied by the Florida Scrub-Jay. The letter stated that, "As a government entity which issues permits allowing private landowners to develop their property, you are responsible for ensuring that activities authorized by the county will not be harmful to the Scrub-Jay or any other listed species."

At the time the HCP was developed it was estimated that over 14,000 quarter acre parcels zoned for residential development existed within habitat that may be occupied by Scrub-Jays. The HCP was issued by the U.S. Fish and Wildlife Service (USFWS) in 2015 pursuant to Section 10 of the Endangered Species Act (ESA) of 1973. The Countywide HCP reduces the need, time, and cost associated with USFWS consultation under the ESA and provides timely regulatory certainty. Although project-by-project coordination is not needed under the HCP, it still provides measures to ensure Scrub-Jays continue to reside within Charlotte County. To assist in the protection of the Scrub-Jay, a "Reserve" totaling approximately 4,500 acres, was designated under the HCP to serve as compensation for loss of occupied Scrub-Jay habitat.

The economic benefit of the Countywide Scrub-Jay HCP is two-fold. The HCP creates a more streamlined and economically favorable process for private landowners in the County to develop on lots within Scrub-Jay habitat. This development increases the property value and therefore tax base for Charlotte County. The HCP also creates a mechanism for the County to collect development fees specific to these properties based on their acreage of Scrub-Jay habitat. These development fees are applied to acquisition of conservation lands within the HCP Reserve and allots funds for the management of these lands for Scrub-Jays.

At the time of the HCPs development, Charlotte County's 2010 Evaluation and Appraisal Report (EAR) indicated over 108,000 vacant lots within the Urban Service Area Overlay. These vacant lots included more than 102,000 residential lots. The HCP application process and fee structure for applicants within Scrub-Jay habitat minimizes the logistical and financial deterrent of building in these locations while still providing habitat compensation and protection for Scrub -Jays.

The HCP document analyzed the estimated cost to landowners within Florida Scrub-Jay areas under the previous USFWS permitting standard versus under the County's HCP program. This analysis determined a total cost to all the landowners to be between $431 million and $865 million. These cost account for application fees, Scrub-Jay survey costs, consultant fees, and mitigation fees. The mitigation fees alone were estimated between $140 million and $350 million, and under the USFWS program this mitigation money would fund the management and acquisition of Scrub-Jay habitat outside the county. In comparison, at the inception of the program, the estimated cost to these same landowners under the County's HCP was $56.2 million. This results in a savings to these landowners of anywhere from $375 million to $809 million. It is anticipated that the savings and streamlined process of the HCP had and continues to encourage these landowners to develop their residential lots.

In fact, as of December 2020, the owners of 1,183 lots have elected to participate in the County's HCP. A summary of the number of lots (parcels) approved at each of the County's development fee acreage tiers is included by year in the tables below. These tables were extracted from the County's 2020 Annual Countywide Scrub-Jay Habitat Conservation Plan Report prepared for the USFWS.

Based on the 2021 Charlotte County Tax Roll, the taxable value of undeveloped residential lots was approximately $1.25 Billion for a total of 97,497 lots, an average of roughly $13,000 per lot. The taxable value of single-family homes was approximately $12 Billion for a total of 76,364 single-family homes lots, and average of about $150,000 per lot. Therefore, providing a more favorable process for the owners of these residential lots to develop them, creates substantially more tax revenue for the County. The HCP allows the County to gain this tax base revenue without sacrificing protection measures for the Scrub-Jay. Prior to the Habitat Conservation Plan, the property appraiser lowered the taxes on Florida Scrub-Jay lots since they were hard to develop on. Since the inception of the HCP these lots are now assessed at 100%, resulting in higher tax revenue for the Charlotte County.

2015	
HCP Development Fees	# of parcels
Tier 1 (0.00 - 0.22 acres)	12
Tier 2 (0.23 - 0.49 acres)	66
Tier 3 (0.50 - 1.00 acres)	2
Tier 4 (1.01 - 3.00 acres)	1
Tier 5 (3.01 - 5.00 acres)	0
Tier 6 (5.01 - 20.00 acres)	1
Tier 7 (20.01 - 99.99 acres)	0
TOTAL	**82**

2016	
HCP Development Fees	# of parcels
Tier 1 (0.00 - 0.22 acres)	27
Tier 2 (0.23 - 0.49 acres)	101
Tier 3 (0.50 - 1.00 acres)	1
Tier 4 (1.01 - 3.00 acres)	3
Tier 5 (3.01 - 5.00 acres)	0
Tier 6 (5.01 - 20.00 acres)	0
Tier 7 (20.01 - 99.99 acres)	0
TOTAL	**132**

2017	
HCP Development Fees	# of parcels
Tier 1 (0.00 - 0.22 acres)	31
Tier 2 (0.23 - 0.49 acres)	128
Tier 3 (0.50 - 1.00 acres)	15
Tier 4 (1.01 - 3.00 acres)	3
Tier 5 (3.01 - 5.00 acres)	1
Tier 6 (5.01 - 20.00 acres)	0
Tier 7 (20.01 - 99.99 acres)	0
TOTAL	**178**

2018	
HCP Development Fees	# of parcels
Tier 1 (0.00 - 0.22 acres)	45
Tier 2 (0.23 - 0.49 acres)	155
Tier 3 (0.50 - 1.00 acres)	16
Tier 4 (1.01 - 3.00 acres)	2
Tier 5 (3.01 - 5.00 acres)	0
Tier 6 (5.01 - 20.00 acres)	1
Tier 7 (20.01 - 99.99 acres)	0
TOTAL	**219**

2019	
HCP Development Fees	# of parcels
Tier 1 (0.00 - 0.22 acres)	59
Tier 2 (0.23 - 0.49 acres)	205
Tier 3 (0.50 - 1.00 acres)	29
Tier 4 (1.01 - 3.00 acres)	4
Tier 5 (3.01 - 5.00 acres)	1
Tier 6 (5.01 - 20.00 acres)	0
Tier 7 (20.01 - 99.99 acres)	0
TOTAL	**278**

2020	
HCP Development Fees	# of parcels
Tier 1 (0.00 - 0.22 acres)	93
Tier 2 (0.23 - 0.49 acres)	194
Tier 3 (0.50 - 1.00 acres)	3
Tier 4 (1.01 - 3.00 acres)	4
Tier 5 (3.01 - 5.00 acres)	0
Tier 6 (5.01 - 20.00 acres)	0
Tier 7 (20.01 - 99.99 acres)	0
TOTAL	**294**

Charlotte County's Environmental Resources Analysis

Charlotte County is located on the east coast of Southwest Florida with Sarasota and Desoto Counties to the north, Glades County to the east, and Lee County to the south. The natural environment of Charlotte County is known to be a driving factor in the County's tourism industry and rapid population growth. One of the purposes of the Charlotte County Parks and Natural Resources Division is to provide a system of public recreation and open space sites that allow for both activity-based and resource-based recreational opportunities which allow visitors and residents to enjoy the natural environment of the County.

The Charlotte County Parks and Recreation Master Plan establishes a vision statement which says "We envision an unparalleled, attractive, connected, and sustainable parks and recreation system that focuses on regional and community-based opportunities, while preserving environmentally-sensitive resources and enticing residents and visitors to "Get Up. Get Out. Get Active".

To achieve this goal Charlotte County has acquired 64 parks and preserve lands. Preserves are generally larger parcels containing environmentally sensitive lands and habitat types. Preserves also generally contain less urban interface with limited public uses and amenity facilities and management objectives focused on environmental preservation and resources first and foremost. There are five categories of parks within the County. Environmental Parks is one of the five categories and can further be broken down into Preserves, Environmental Parks, Mitigation Lands, and Natural Lands. However management of these lands do not solely focus on environmental preservation, but also manage the natural resources from a human dimension and provide more opportunities for residents and visitors to interact with nature. Environmental parks are typically smaller than preserves and contain more urban interfaces and public uses and amenities.

The other four categories include Neighborhood, Community, Regional, and Special Purpose. Neighborhood, Community, and Regional parks are urban area parks that serve the recreational needs of residents. Neighborhood parks serve residents within walking distance to the park and typically are limited to 10 acres in size. Community Parks can be up to 50 acres in size and serves multiple neighborhoods. Community parks also generally offer more intense recreation facilities than neighborhood parks, such as lighted fields and courts. Regional parks are typical over 50 acres in size offer large-scale and intense recreation facilities (i.e., sports fields, gymnasiums, pools) to serve several communities. The location of these parks categories adjacent to environmental lands can provide additional benefits of shared infrastructure.

Special Purpose Parks vary in size based on the amenities provided at the site. These parks serve a unique purpose and include natural, historical, or cultural resource parks. Special purpose parks may provide a benefit to groups or organizations rather than the public at large.

In addition to the designated parks and preserves, there are also 78 parcels that have been acquired by the County that have not yet been named or designated a category. These lands have been included in this environmental resource analysis as they provide an environmental benefit regardless of their category designation.

Charlotte County Community Services accommodates a wide variety of goals and objectives with their parks and preserves, as a result the environmental resources both physical and biological in nature located within them are diverse. This section documents the physical and biological environmental resources available within Charlotte County and within the umbrella of the Charlotte County Parks and Natural Resources Division. These physical and biological resources are interdependent and their interactions shape the ecosystems found within the County. Urban areas are known to present unique challenges for the conservation of ecosystems. However numerous studies have indicated that parks and preserves within urban areas also provide some compensation for the effects of urbanization. They also transform communities into a more pleasant community by providing ecosystem services and accessibility to the natural environment.

This section also demonstrates the value of the natural resources within the County parks and preserves in both the urban area parks and environmental parks and preserves. Likewise it demonstrates how the establishment and maintenance of these parks and preserves provides an environmental benefit within Charlotte County and achieves the goals of the FRPA Environment Pillar and NRPA Conservation Pillar.

Climate Analysis

The climate in Southwest Florida is humid and sub-tropical due to influences from the Caribbean Sea and the Gulf of Mexico. The Bermuda high pressure cell prevents convective clouds from building into thunderstorms in the fall and winter months. As the Bermuda high weakens in the late spring, thunderstorms occur regularly and signals the start of the wet season, which occurs from June through October. In addition to the pattern of daily rainfall and thunderstorms, large-scale circulation systems such as tropical storms and hurricanes occur during the summer months into the fall. The official Atlantic hurricane season is June 1 through November 30. The period of greatest hurricane frequency in Southwest Florida is the three-month period from August to October, when 90 percent of all hurricanes passing through the region have historically occurred.

Weather systems (fronts) from the Northeastern United States pass over the area in the late fall, winter, and early spring. These fronts bring swings in temperature and humidity, causing the weather to shift. Temperature influences are exerted, as well with infrequent, but significant freezes occurring in December and January (FCC 2005). These freezes occasionally impact vegetation by damaging cold sensitive tropical plants. Cold fronts regularly push cool and moist weather from the Southeastern United States to Southwest Florida during the winter. Table #3 shows the average high and low temperatures for Charlotte County, Florida from 1991-2020 compiled by the National Oceanic and Atmospheric Administration's National Centers for Environmental Information. As a result Southwest Florida's sub-tropical climate, the region contains unique ecosystems and species, some of which are endemic to Florida.

Table #3. Average High/Low Temperatures for Charlotte County, FL (1999-2020)

Temp (°F)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
High	75.3	78.1	81.3	85.8	90.1	91.7	92.5	92.5	90.7	87.4	81.7	77.6
Low	50.5	53.0	55.7	60.5	65.6	71.8	74.1	74.5	73.4	66.9	58.8	54.1

Geology and Topography of Charlotte County

Geology and topography are recognized as important factors in shaping plant communities and ecosystems. Slight variations in topography can alter soil chemistry and hydrology. In southwest Florida, ten physiographic provinces (SWFRPC 2002) are present. These provinces are based on geographic features including terrain, rock type, geologic structure, and history. Charlotte County is located within the Gulf Coastal Lowlands the Caloosahatchee Valley, Caloosahatchee Incline, and the Desoto Plain. A description of these four physiographic provinces is included below. A map of the Charlotte County physiographic provinces is included as Appendix A.

Gulf Coastal Lowlands: The Gulf Coastal Lowlands comprise the majority of Charlotte County and is separated from the DeSoto Plain by marine terraces that developed on the south side of the Peace River Valley. The upland to shoreline transition is a gradual southwestward slope comprised of depositional sediments that are marine in origin.

Caloosahatchee Valley: The Caloosahatchee Valley is lower lying feature associated with the Caloosahatchee River. This province is located along the southern boundary of Charlotte County.

Caloosahatchee Incline: The Caloosahatchee Incline forms the southern bounding scarp of the DeSoto Plain. The crest of the incline is at 60 feet above mean sea level while the toe is at 30-35 feet above mean sea level.

DeSoto Plain: The Desoto Plain is located in the northeast portion of Charlotte County and is flat and broad. The southern portion of the plain end in a scarp which declines 30 feet in elevation over five to six miles. The plain is believed to be an emergent, submarine shoal that was formed during a time of high sea level.

Most of Charlotte County is located within the Coastal Lowlands region which forms the entire Florida coastline and reaches inland as far as 60 miles. The inner edge generally lies along the 100 foot elevation line. In recent geologic times, these lowlands were marine terraces and experiences three of more successive inundations by higher sea levels. The Coastal Lowlands is a flat region except where ancient shorelines or dune ridges occur or where the surface has been modified by stream erosion of underground solution (SWFRPC 2002). A topographic map of Charlotte County is included as Appendix B.

Soil Survey of Charlotte County

Soils play a critical role in formation of vegetative communities, as plant species have unique soil requirements. Soil characteristics such as pH, nutrient availability, hydrology, and organic matter, are driving factors in determining the types of plant species that can be supported and therefore the types of habitats formed. The Soil Survey of Charlotte County, Florida was conducted as part of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies, and local agencies. The soil survey was designed for a range of stakeholders from varying backgrounds to be able understand soil behavior, physical and chemical properties, land use limitations, potential impacts, and protection of the environment.

The Soil Survey of Charlotte County identifies 71 soil types within the Charlotte County Parks and Natural Resources lands. A list of these soil types and their acreages is included as Appendix C. A typical soils map is included as Appendix D and a Soil Attributes Table is included as Appendix E. Of the soil types within Charlotte County Parks and Natural Resources 2,720.57 acres or 46.2 percent are classified as hydric soils. Hydric soils are soil types that are likely to support the formation of wetland habitats.

Hydrologic Components

Hydrology is the study of the movement and distribution of water within a system. The source, direction and varying quality and quantity of water are all considered in the study of hydrology. Climate, topography, geology, soils, natural communities, and anthropogenic alterations to a landscape are all influences on the way water flows and drains.

Much of Florida is covered by water, with roughly 2.8 million acres of the state submerged (SWFRPC 2002). The natural surface hydrology of southwest Florida is a result of the interaction between the subtropical climate, topography, and geology. In Charlotte County major freshwater systems include the Peace River, Prairie Creek, Shell Creek, and Alligator Creek. Major saltwater and brackish water systems within the County include Charlotte Harbor, Gasparilla Sound, and Lemon Bay.

In 1974 the U.S Fish and Wildlife Service (USFWS) Office of Biological Services conducted and inventory of the nation's wetlands. By 1977 the National Wetlands Inventory (NWI) wetland maps were prepared by analyzing aerial imagery in conjunction with field work and other data sources. Federal agencies, state agencies, local institutions, and private industries use this data to inform management decisions, research, and policy development. The NWI maps identify 5 major systems which are riverine, palustrine, lacustrine, estuarine, and marine. Descriptions of each of these systems are included below.

Riverine systems: Riverine systems include wetlands and deep water habitats contained within a channel that contains freshwater systems. Riverine habitats are primarily open with little plant life. Palustrine and forested systems frequently are located along the edges of these systems or in islands within them.

Palustrine systems: These systems are often referred to as swamps, marshes, bogs, or fens. These are non-tidal wetland systems that typically dominated by trees, shrubs, and emergent aquatic plants. These freshwater systems may have tidal influences, but salinity will be less than 0.5 percent.

Lacustrine systems: Lacustrine systems occur in depressions or dammed rivers. These areas are typically larger than 20 acres in size and typically lack plant life. Examples of such systems are lakes and reservoirs.

Estuarine systems: Estuarine systems are defined as deep water tidal communities and adjacent tidal wetlands. These areas are tidally influenced and either have open, partially obstructed, or sporadic access to the open ocean and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

Marine systems: These systems consist of the open ocean overlying the continental shelf and its associated coastline. Marine systems are highly tidally influences and have salinities greater than 30 percent and support a wide variety of marine flora and fauna.

The USFWS NWI map identifies approximately 1,610.99 acres of wetlands and waters within Charlotte County parks and preserves. Table #4 provides the acreages of these NWI classifications within Charlotte County parks and preserves. A typical NWI map is included as Appendix F. The variations in salinity and physical features of each of the 5 systems influences the types of vegetative communities established, wildlife inhabiting them, and ecosystem functions provided.

Table #4. NWI Classification within Charlotte County Parks and Preserves		
NWI Classifications	**Acreage**	**Percent of NWI Classification**
Riverine	61.19	3.80%
Palustrine	1,004.70	62.37%
Lacustrine	60.56	3.76%
Estuarine	481.87	29.91%
Marine	2.67	0.16%
Total	1,610.99	100.00%

Land Use and Vegetative Communities

As previously described, the land use and vegetative communities located within the Charlotte County parks and preserves is a function of land management, climate, geography, topography, soils, and hydrology.

The land use and vegetative communities located within the Charlotte County parks and preserves were identified using the Southwest Florida Water Management Districts (SWFWMD) 2018 Florida Land Use Cover and Forms Classification System (FLUCFCS) Mapping. This mapping was accomplished by the SWFWMD through interpretation of aerial photography. As such, this mapping is subject to some classification errors.

A total of 37 land use and vegetative community types were identified on the Charlotte County Parks and Natural Resource land. The most abundant of the land use and vegetative cover types include Pine Flatwoods (FLUCFCS Code 4110) with 1363.66± acres or 23.14 percent, Shrub and Brushland (FLUCFCS Code 3200) with 949.37± acres or 16.11 percent and Open Land (FLUCFCS Code 1900) with 645.32 ± acres or 10.95 percent.

In total, salt and freshwater wetland habitats (6000 series FLUCFCS Codes) comprise 1,271.73± acres or 21.58 percent. Another 223.51 ± acres or 3.79 percent is comprised of open water habitats (5000 series FLUCFCS Codes) and includes, streams and waterways, lakes, reservoirs, bays and estuaries.

A full list of the Charlotte County Parks and Natural Resources FLUCFCS Codes, descriptions, and acreages are included as Table #5. A typical FLUCFCS Map is provided as Appendix F and detailed descriptions of each FLUCFCS code identified in Table #6 is provided as Appendix G.

Table #5. Charlotte County Parks and Preserves FLUCFCS Codes

FLUCFCS Code	FLUCFCS Description	Acreage	Percent
1100	Residential Low Density <2 Dwelling Units Per Acre	132.46	2.25%
1200	Residential Medium Density 2 to 5 Dwelling Units Per Acre	59.85	1.02%
1300	Residential High Denisty	8.13	0.14%
1400	Commercial and Services	20.49	0.35%
1500	Industrial	7.32	0.12%
1700	Institutional	64.31	1.09%
1800	Recreational	479.64	8.14%
1820	Golf Courses	2.74	0.05%
1900	Open Land	645.32	10.95%
2100	Cropland and Pastureland	195.88	3.32%
2200	Tree Crops	3.02	0.05%
2600	Other Open Lands	9.04	0.15%
3200	Shrub and Brushland	949.37	16.11%
3300	Mixed Rangeland	67	1.14%
4110	Pine Flatwoods	1363.66	23.14%
4200	Upland Hardwood Forests-Part 1	19.26	0.33%
4340	Upland Hardwood-Coniferous Mix	357.86	6.07%
5100	Streams and Waterways	35.84	0.61%
5200	Lakes	65.54	1.11%
5300	Reservoirs	58.32	0.99%
5400	Bays and Estuaries	63.81	1.08%
5720	Gulf of Mexico	0	0.00%
6100	Wetland Hardwood Forests	1.26	0.02%
6120	Mangrove Swamps	65.61	1.11%
6150	Stream and Lake Swamps (Bottomland)	526.09	8.93%
6200	Wetland Coniferous Forests	57.61	0.98%
6300	Wetland Forested Mixed	39.53	0.67%
6400	Vegetated Non-Forested Wetlands	25.93	0.44%
6410	Freshwater Marshes	228.86	3.88%
6420	Saltwater Marshes	232.76	3.95%
6430	Wet Prairies	85.65	1.45%
6440	Emergent Aquatic Vegetation	3.68	0.06%
6530	Intermittent Ponds	2.64	0.04%
6600	Salt Flats	2.11	0.04%
7400	Disturbed	6.31	0.11%
8100	Transportation	4.87	0.08%
8300	Utilities	2.55	0.04%
Total		5894.32	100.00%

Ecosystem Function

Charlotte County's parks and preserves contain a mixture of uplands, freshwater wetlands, saltwater wetlands, and waters. These varying community types provide a wide range of ecosystem functions. A summary of some of these ecosystem functions is provided below.

Upland hardwood communities are dominated by deciduous hardwood trees. They typically have a diverse assemblage of deciduous and evergreen tree species in the canopy and sub-canopy, shade tolerant shrubs and sparce ground cover. Characteristic canopy species include live oak, laurel oak, southern magnolia, sweetgum, southern hackberry. These communities provide nesting, denning, and foraging habitat for a variety of mammals, reptiles, and amphibians.

Pine flatwoods provided foraging habitat and nesting and denning sites for a variety of birds, mammals, reptiles, and amphibians. There are a number of rare wildlife species that occur within flatwoods as well as many rare plant species, some of which are endemic species. During the wet season (June through October) pine flatwoods provide dry refuge for non-aquatic animals. During severe flooding events, these habitats serve as a water storage area to protect adjacent lands from flooding. Hydric pine flatwoods function seasonally as both wetland and upland. This transition allows for abundant diversity of plant life and as a result supports a wide range of wildlife.

Freshwater wetlands within southwest Florida are an important component of the region's natural environment. Many bird species feed in these locations, and fish and amphibians live and breed in these habitats. These habitats also improve water quality and assist in recharging aquifers. Freshwater wetlands are influenced by seasonal rainfall changes. These wetlands fill to capacity in the rainy season and fish populations begin to increase in number and in biomass. When the wet season ends, water levels recede, and fish become concentrated in shallower pools of water. This concentration of fish presents an opportunity for wading birds to forage. By feeding on the fish, the density of fish remaining decreases and the availability of dissolved oxygen increase. Wildlife who rely on these habitats have adapted to these seasonal fluctuations, often migrating from one wetland to another as they begin to dry up.

Marshes specifically are important to many species of wading birds for nesting success. White ibis (*Eudocimus albus*) select nesting sites in proximity to marshes that have appropriate drying conditions. Wood storks (*Mycteria americana*) and some species of herons require specific receding water conditions over their four-month nesting season. The faster a marsh dries out; the sooner nesting starts. If water levels begin to rise, then nesting success declines.

The seasonally fluctuations of freshwater wetlands are also important for the plant species within them. When the plants in these wetlands become completely dry, die, and decay, they release nutrients from their tissue. This release of nutrients enters the soil which in turn makes them more productive for the following wet season. In addition, many aquatic plants cannot germinate under water and require a period of drying to reproduce.

Forested freshwater wetlands (i.e., wetland hardwood forests, wetland coniferous forests, wetland forested mixed communities) provide cover and foraging habitat for woodpeckers, warblers, and other migratory songbirds. These forested systems play a critical role by storing rain and stormwater and by improving water quality by filtering nutrients and pollutants.

Charlotte County's parks and natural resources also contain an assortment of coastal plant communities. Several of which act as shoreline stabilizers to protect communities from storm damage. This protection is dependent on dense vegetation to buffer storm conditions.

Salt flats are treeless flat lands generally behind dunes on barrier islands. They may be periodically flooded and covered with sand and debris during major storms. Shorebird species are known to nest in this community type.

The beaches of Southwest Florida provide an important refuge for wintering shorebirds. Florida's most abundant wintering shorebirds include sanderlings (*Calidris alba*), least sandpiper (*Calidris minutilla*), western sandpiper (*Calidris mauri*), dunlin (*Calidris alpina*), short-billed dowitcher (*Limnodromus griseus*), semipalmated plover (*Charadius semipalmatus*), black-bellied plover (*Pluvialis squatarola*), ruddy tunstone (*Arenaria interpres*) and willet (*Catoptophorus semipalmatus*). When mud flats and sand bars become exposed at low tide they provide an important feeding area due to their high diversity of macro invertebrates. These habitats in southwest Florida also provide a rest location for shorebird species who continue their migration further north or south. These include such species as Red knots (*Calidris canutus*), black terns (*Chlidonias niger*) and common terns (*Sterna hirundo*).

Mangrove swamps are a unique costal community in Southwest Florida. They play a critical role as nursery grounds for most of Florida's commercially and recreationally important fish and shellfish. The prop roots of red mangroves (*Rhizophora mangle*), the aerial roots (pnematophores) of black mangroves (*Avicennia germinans*) and the rooting of the white mangrove (*Laguncularia racemosa*) trap sediments and recycle nutrients from upland areas. This process creates islands and is a part of the process involved in land formation in South Florida. These structures are also important in protecting coastlines from erosion causing tropical storms and hurricanes. They do so by dispersing wave energy and providing stabilization for the shoreline with their root systems.

Mangrove swamps also provide breeding grounds for a substantial number of wading bird and shorebird species as well as other animals (FNAI and FDNR 1990). There are several species of wildlife that are exclusively found in mangrove swamps. This includes the mangrove salt marsh snake (*Nerodia clarkii*), the mangrove skipper (*Phocides pigmalion*) and the black mangrove buckeye (*Junonia evarete*). In addition, mangrove trees can produce up to 80 percent of the total organic material in the aquatic food web through their continuous shedding of leaves and plant components.

Charlotte County's parks and natural resources also contain a significant number of lands that have been altered to serve human uses. These areas still provide natural functions and ecosystem services. For example, American kestrel (*Falco sparvarius*), crested caracara (*Caracara cheriway*), sandhill crane (*Antigone canadensis*) and Florida Scrub-Jay (*Aphelocoma coerulescens*) are known to use abandoned fields that provide open habitat. Artificial ponds, ditches, and reservoirs are also known to provide foraging habitat and a source of water for wildlife during the dry season, particularly for amphibians and wading birds.

Wildlife Species

Charlotte County's parks and natural resources provide a variety of habitat types and therefore provide habitat and support for a variety of species of wildlife. Some species are endemic to southwest Florida and/or are listed as threatened or endangered by the Florida Fish and Wildlife Conservation Commission (FWC), United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS). A list of the species that have the potential to occur within Charlotte County parks and natural resources is listed in Table #6 and was generated using the USFWS Information for Planning and Consultation (IPaC) tool.

Gulf Sturgeon: The gulf sturgeon is the only sturgeon species found in Florida's gulf coastal waters. Adults and subadults spend the coldest 3-4 months in the Gulf of Mexico and the rest of the year in major panhandle rivers. They are in decline due to the damming of many of north Florida's rivers that drain into the Gulf.

Smalltooth Sawfish: Smalltooth sawfish are one of five species of sawfish they get their name from their distinct long, flat snout (rostrum) which is lines with teeth that looks like a saw. They prefer shallow coastal waters and sometimes the lower limits of freshwater river systems. The species decline is attributed to habitat loss and accidental capture in fisheries. Charlotte Harbor contains area designated as critical habitat for this species.

American Alligator: American alligators have recovered dramatically since the 1960s. There are now some populations large enough to support limited harvests. Pollution and destruction of wetlands are currently the main threat to this species. Protecting wetlands from ditching, filling and pollution are the management recommendations for this species.

American Crocodile: The American crocodile is occasionally sighted in Charlotte County. South Florida is the northernmost edge of the crocodile's range, and they were probably never very numerous in the state. However, its range has shrunk considerably due to the increase in human population. The number one cause of mortality for this species in the United States is U.S. Highway 1 in the Florida Keys.

Eastern Indigo Snake: The Eastern indigo snake is a large, iridescent black snake with a red, coral, or white throat (record length, 8.6 feet). This species is found in a large spectrum of habitats throughout Florida and southern Georgia, often associated with gopher tortoise burrows. The Eastern indigo is threatened throughout its range due to habitat loss, degradation, and fragmentation. Although it is now illegal to possess this animal without the proper permits, the pet trade is another cause for decline of this species. The most common causes of mortality are human caused, either by people afraid of snakes or accidental highway mortality. The indigo snake utilizes a home range of approximately 125-250 acres, and the males are territorial during the breeding season. The indigo snake feeds diurnally on fish, frogs, toads, lizards, snakes, small turtles, birds, and small mammals, often around the edge of wetlands. The eastern indigo snake breeds from November through April, then lays 5-10 eggs in May or June.

Table #6. State and Federally Listed Species with the Potential to Occur within Charlotte County Parks and Natural Resources

Common Name	Scientific Name	Listing Status	
		USFWS/ NMFS	FWCC
	Fish		
Gulf Sturgeon	*Acipenser oxyrinchus*	FT	FT
Smalltooth Sawfish	*Pristis pectinata*	FE	FE
	Reptiles		
American Alligator	*Alligator mississippiensis*	FT (S/A)	FT (S/A)
American Crocodile	*Crocodylus acutus*	FT	FT
Eastern Indigo Snake	*Drymarchon corais couperi*	FT	FT
Green Sea Turtle	*Chelonia mydas*	FT	FT
Gopher Tortoise	*Gopherus polyphemus*	--	ST
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	FE	FE
Leatherback Sea Turtle	*Dermochelys coriacea*	FE	FE
Loggerhead Sea Turtle	*Caretta caretta*	FT	FT
	Birds		
American Oystercatcher	*Haematopus palliatus*	--	ST
Audubon's Crested Caracara	*Caracara cheriway*	FT	FT
Bald Eagle	*Haliaeetus leucocephalus*	*	*
Black Skimmer	*Rynchops niger*	--	ST
Florida Burrowing Owl	*Athene cunicularia floridana*	--	ST
Florida Grasshopper Sparrow	*Ammodramus savannarum*	FE	FE
Florida Sandhill Crane	*Antigone canadensis pratensis*	--	ST
Florida Scrub-Jay	*Aphelocoma coerulescens*	FT	FT
Least Tern	*Sternula antillarum*	--	ST
Little Blue Heron	*Egretta caerulea*	--	ST
Piping Plover	*Charadius melodus*	FT	FT
Red Knot	*Calidris canutus rufa*	FT	FT
Red-cockaded Woodpecker	*Picoides borealis*	FE	FE
Reddish Egret	*Egretta rufescens*	--	ST
Roseate Spoonbill	*Platalea ajaja*	--	ST
Snowy Plover	*Charadrius nivosus*	--	ST
Southeastern American Kestrel	*Falco sparverius paulus*	--	ST
Tricolored Heron	*Egretta tricolor*	--	ST
Wood Stork	*Mycteria americana*	FT	FT
	Mammals		
Florida Bonneted Bat	*Eumops floridanus*	FE	FE
Florida Panther	*Puma concolor coryi*	FE	FE
West Indian Manatee	*Trichechus manatus*	FT	FT

FE – Federally Endangered
FT – Federally Threatened
FT(S/A) – Federally Threatened Due to Similarity of Appearance
ST – State Threatened
**Bald and Golden Eagle Protection Act

Gopher Tortoise: Gopher tortoises are in decline throughout their range due to loss and degradation of habitat. As a species dependent on dry, upland communities much of their habitat has been lost to urban and residential development, agriculture, citrus groves, mining, and pine plantations. Additional threats include a highly contagious respiratory disease and human consumption.

Exotic plant removal, pine tree thinning, brush reduction, and prescribed burning will benefit this species. Before restoration activities that utilize heavy equipment take place in areas with high burrow concentrations, staff will provide operator burrow maps, or will mark off burrows. Staff will determine if burrows will be flagged, and equipment operators will be advised to stay away from the burrows based on type of work being planned and time of year. High intensity chopping should be planned for winter months when gophers will be less active outside of the burrow.

Green, Kemp's Riley, Leatherback, and Loggerhead Sea Turtle: Sea turtles face many challenges in Florida including coastal development, boat propellers, hatchling disorientation due to bright lights, human consumption of turtles and their eggs, pollution, shrimp trawls, long-line and gill-net fisheries, fire ants, nest depredation due to exploding raccoon populations and beach erosion.

All are present in the Gulf of Mexico. Loggerhead, and Kemp's ridley sea turtles are known to nest on Charlotte County beaches during nesting season which occurs between May 1 and October 31. Green sea turtles are usually found near shore in and around sea grass beds while leatherback sea turtles are most likely to be observed offshore where jellyfish are plentiful.

American Oystercatcher: The American oystercatcher is found on intertidal areas and adjacent beaches, particularly barrier islands. They prefer sandy and shelly beaches for nesting but will also nest in sandy spots within salt marshes. Artificial beaches and dredge spoil island are also known to attract oystercatchers. The species is declining due to loss of habitat and harassment from people and domestic animals.

Audubon's Crested Caracara: The caracara has large habitat requirements and requires habitats with minimal canopy and understory cover. They frequently use agricultural fields for foraging. As a result, the conversion of agriculture and rural open lands to residential uses has been identified as a source of species decline.

Bald Eagle: Bald eagle population numbers have been increasing within Florida steadily since a low of 120 active nests was reported in 1973. The primary cause of decline of the species was attributed to impacts from Dichlorodiphenyltrichloroethane (DDT), an insecticide that was previously used in agriculture. Secondary poisoning from the consumption of lead shot in waterfowl was also identified as a contributing factor to the species decline, which ultimately lead to a ban on lead shot for waterfowl in 1991. The bald eagle is no longer federally listed under the Endangered Species Act, but still receives protection under the Golden and Bald Eagle Protection Act.

Black Skimmer: Black skimmers live in coastal areas, typically on sandy beaches or islands. They occasionally can be found inland around large lakes. To forage they frequent areas where prey is concentrated such as, bays, estuaries, lagoons, ditches, and saltmarsh pools. The species has been affected by habitat decline, human disturbance and predation from both wild and domestic animals.

Florida Burrowing Owl: The Florida burrowing owl nests underground in burrows. They will dig their own burrow or utilize a burrow that was already created by another animal. They require sparsely vegetated areas of sandy ground, such as pasture, road right-of ways, and residential yards. As a result, they often reside close to human activities which has exposed them to collisions with vehicles, domestic animal attacks, pesticide poisoning, and human harassment.

Florida Grasshopper Sparrow: The Florida grasshopper sparrow resides exclusively in dry prairie communities. The reasons for the species decline include habitat loss and degradation, predation of nest, disease, and genetic problems.

Florida Sandhill Crane: Threats to Florida sandhill cranes include loss and degradation of wetlands, fire suppression, free ranging dogs and cats, and fencing entanglement. Unusually high-water levels during nesting season and extended droughts are also threats to reproduction of the species.

Florida Scrub-Jay: The Florida Scrub-Jay is endemic to Florida. They are dependent on oak species for a large portion of their diet and have specific habitat requitements. Optimal sub-canopy height for Scrub -Jays is 4 to 5.5 feet. Habitat loss, fire suppression, and attacks by domestic animals have all been attributed to the species decline.

Least Tern: Least Tern's nest on sandy beaches and gravel rooftops in Florida, including Charlotte County. While population numbers for this species have been increasing since the 1970's the species is still listed as Threatened by the state of Florida. The Least Tern is known to be affected by habitat destruction, human disturbance, pollution, and predation by racoons.

Little Blue Heron, Reddish Egret, Roseate Spoonbill & Tricolored Heron: The little blue heron's and tricolored heron's decline are due to loss of freshwater wetlands and alteration of their natural hydroperiod. There is also some indication that pesticides and heavy metal contamination may affect herons. The reddish egret has also been declining throughout their ranges since the 1950's. It is believed that the cause of this decline is the loss and alteration of wetlands where they forage. Roseate spoonbills nest in mangrove areas and occasionally in willow trees within freshwater wetlands. The forage in shallow-water and their decline is attributed to disturbance of nesting colonies and alteration of foraging sites.

Piping and Snowy Plovers: The piping plover prefers sandflats or sandy mudflat habitats adjacent to inlets or passes. They are a winter resident within Florida and the primary concern for the species is harassment by people and their pets while foraging. Other concerns include inlet and shoreline stabilization, dredging of inlets, beach maintenance and renourishment, and pollution.

Like the piping plover, snowy plovers are declining due to habitat loss and harassment by humans and pets. They are typically found in sandy areas adjacent to water. This includes beaches but also shores of inland lakes. They also will use wastewater ponds, reservoir margins, spoil piles, river sand bars, and occasionally disused parking lots.

Red Knot: Red knots are present in marine habitats in Florida (i.e. beaches, salt marshes, bays and estuaries, and mangroves) during the non-breeding season. Loss of both breeding and non-breeding habitat has resulted in this species decline. The USFWS has designated critical habitat for the red knot in Charlotte County along the gulf edge of Don Pedro Island.

Red-cockaded Woodpecker: The red-cockaded woodpecker inhabits open, mature pine flatwoods that contain diverse groundcover and uneven aged stands of pines. Habitat fragmentation, fire suppression, and invasion by exotic plant species has reduced the amount of suitable habitat for the species.

Southeastern American Kestrel: The southeastern American kestrel is found in open pine habitats, woodland edge, prairies, and pastures. They typically nest in cavities of tall dead trees or within utility poles. Kestrels require open patches of grass or bare ground in flatwood settings for successful foraging. Declines in availability of suitable nesting and foraging habitat have affected population numbers for the species.

Wood Stork: Wood storks are sensitive to water levels within freshwater wetlands. They require high concentrations of fish in shallow water for foraging. Decline of this species is attributed to disturbance of nesting colonies, loss of wetlands, and alterations to hydrology of wetlands.

Florida Bonneted Bat: The Florida bonneted bat is medium in size with long ears that extend to the center of their backs. Bonneted bats roost primarily in trees and in manmade artificial structures, with roost availability indicated as an important limiting factor (USFWS 2014). Foraging habitat include areas over water such as ponds, wetlands, streams, canals, ditches, or over open ground such as forest edges, tree lines, corridors, prairies, pastures, golf courses, and croplands (Marks and Marks 2006). The greatest threats to Florida bonneted bats are loss of habitat, including the destruction of natural roost sites, and natural disasters such as hurricanes. The USFWS has proposed critical habitat designation for this species in Charlotte County along the edge of the Peace River and around the Babcock-Webb Wildlife Management Area.

Florida Panther: The Florida panther is a subspecies of cougar that is currently restricted to southwest Florida in an area less than five percent of its historic range. Habitat loss, vehicular collisions, feline leukemia, and intraspecific aggression are all factors attributed to the species decline. However, populations have been increasing in recent years. Previously it was believed that the only breeding population of panthers was located south of the Caloosahatchee River, but in 2017 female panthers with kittens were documented on trail cameras in Charlotte County demonstrating that panthers are now breeding in this area.

West Indian Manatee: The West Indian manatee is ground in inland streams, canals, and rivers, as well as the Gulf of Mexico. They forage on sea grasses and travel further inland when water temperature cool and to birth their young. The species has been negatively impacted by boat collisions, loss of sea grass habitat, and entrapment in crab traps and fishing line.

Plant Species

In addition to listed wildlife species, there are also many plant species that are listed by the Florida Department of Agriculture and Consumer Services (FDACS) that have the potential to occur within the Charlotte County parks and preserves. Table #7 includes a list of those species and their FDACS listing status.

Table #7. Listed Plant Species with the Potential to Occur within Charlotte County Parks and Preserves

Common Name	Scientific Name	FDACS Status
Angularfruit Milkvine	*Gonolobus suberosus*	T
Beachberry	*Scaevola plumieri*	T
Blueflower Butterword	*Pinguicula caerulea*	T
Cardinal Airplant	*Tillandsia fasciculata*	E
Catesby's Lily	*Lilium catesbaei*	T
Drysand Pinweed	*Lechea divaricata*	E
Erect Pricklypear	*Opuntia stricta*	T
Florida beargrass	*Nolina atopocarpa*	T
Florida Loosestrife	*Lythrum flagellare*	E
Florida Mayten	*Tricerma phyllanthoides*	T
Giant Airplant	*Tillandsia utriculate*	E
Giant Orchid	*Orthochilus ecristatus*	T
Golden Leather Fern	*Acrostichum aureum*	T
Iguana Hackberry	*Celtis iguanaea*	E
Jameson's Waterlily	*Nymphaea jamesoniana*	E
Joewood	*Jacquinia keyensis*	T
Lacelip Ladiestresses	*Spiranthes laciniata*	T
Leafless Beaked Ladiestresses	*Sacoila lanceolata* var. *lanceolata*	T
Longlip Ladiestresses	*Spiranthes longilabris*	T

Northern Needleaf	*Tillandsia balbisiana*	T
Pretty False Pawpaw	*Asimina pulchella*	E
Sanibel Island Lovegrass	*Eragrostis pectinacea* var. *tracyi*	E
Simpson's Zephyrlily	*Zephyranthes simpsonii*	T
Small's Flax	*Linum carteri* var. *smallii*	E
Snowy Orchid	*Platanthera nivea*	T
Southern Ladiestresses	*Spiranthes torta*	E
Spiny Hackberry	*Celtis pallida*	E
Tampa Mock Vervain	*Glandularia tampensis*	E
Twisted Airplant	*Tillandsia flexuosa*	T
Upland Cotton	*Gossypium hirstum*	E
Wild Century Plant	*Agave weberi*	E
Yellow Butterwort	*Pinguicula lutea*	T

E – Endangered
T – Threatened

Land Management

Charlotte County Community Services Parks and Natural Resources Division protects the County's natural resources and the community by using all their resources available and incorporating the best land management strategies developed. The divisions land management section allows for increased flood control, filtering water resources, recharging the aquifer, cleaning the air, preserving the diversity of plant and animal species, and providing open spaces and recreational opportunities. Charlotte County Parks and Natural Resources Division have developed and are involved in many programs that have a direct positive impact on our natural resources and community.

Invasive Species

Invasive species are organisms not native to an area, that are introduced, become overpopulated, and harm its new environment. Invasive species can have a devastating effect on the environment and economy. Invasive species typically do not have any natural predators, have a high number of offspring, and can out compete native species for resources. Charlotte County Parks and Natural Resources Division works diligently to reduce and prevent invasive species from harming our community and its native habitants.

Invasive Iguanas

Iguanas including the Green Iguana, Black Spiny-Tailed Iguana, and Mexican Spiny-Tailed Iguana have become an established invasive resident in Charlotte County and southwest Florida. Iguanas were introduced to Florida as a result of accidental importation on ships and the pet trade market. Florida subtropical climate provides ideal conditions for iguanas to reproduce rapidly and thrive. In Florida, iguanas have no natural predators to control their population and out-compete native species for food resources and shelter. Charlotte County Parks and Natural Resources Division contracts with USDA to humanely trap and dispose of invasive iguanas on Boca Grande in Charlotte County. In addition to trapping, they provide education to the public regarding the negative impacts iguanas are having on our community, and provide resources for those with unwanted pet iguanas as to properly find them a new home that will not have negative impacts on the community.

Invasive Feral Hogs

Feral hogs are an invasive species that was first introduced to Florida by Spanish explorers in the early 1500s. Their population has since exponentially grown, and they can now be found in all 67 counties of Florida. Feral hogs can reach weights of more than 150 pounds and measure 5 to 6 feet long. These hogs have numerous negative impacts and are responsible for millions of dollars in damages to residential property each year. They do not have many predators, and typically travel in small groups and eat a variety of plants and animals leaving a path of destruction behind. Given their large size and protective behavior, they are considered dangerous and will attack when they feel threatened. Feral hogs are also often carries for pathogens and parasites such as Brucellosis which many native species have no defense.

The Charlotte County Parks and Natural Resources Division, the United States Department of Agriculture, and the Florida Department of Agriculture and Consumer Services all work together to offer their services that include trapping, removal, and disposal of feral hogs

Invasive Plants

There are hundreds of invasive plant species within Southwest Florida. Global assessments on biodiversity have determined the number of invasive species introduced outside of their native range has doubled over the last 50 years with approximately one fifths of the ecosystems in the world at risk of being invaded by these invasive plants. Florida is known to be particularly vulnerable to invasive plants because of its sub tropical climate, diverse ecosystems and peninsular geography. With the vast amount of threatened or endangered species within Southwest Florida and Charlotte County management of invasive plants is crucial to protecting these species and preserving biodiversity. Charlotte County Parks and Natural Resources Division actively manages environmental preserves for invasive plants. Each of Charlotte County's environmental preserves has a land management plan that includes management strategies including measures to address invasive plant species. These measures to address invasive plant species include hand removal, mechanical removal, herbicide treatment, and prescribed fires.

Prescribed Fires

Florida's plant species require periodic fire to promote growth and maintain their habitats in a healthy condition. These fires typically are started by lightning strikes, however with continuing development of Florida, these wildfires have been suppressed. When wildfires are suppressed, an accumulation of natural fuels in the ecosystem is created that puts nearby people and property at risk. More than 40 percent of lands in Charlotte County are protected through conservation/preservation and wildfires are critical to their health and growth. To reduce the risk of wildfires and encourage plant growth, prescribed fires are conducted to mimic the natural fire process. The Charlotte County Parks and Natural Resources Division, the Charlotte County Fire Department, the Florida Forestry Service, and the Florida Department of Environmental Protection work together to schedule and complete prescribed burns throughout Charlotte County.

Programs

Abandoned Vessel Program

A derelict vessel is any vessel that is left or abandoned upon or under the waters of the State in a wrecked, junked, or substantially dismantled condition. An abandoned vessel is any tangible vessel that does not have an identifiable owner and that has been disposed of on public property in a wrecked, inoperative or partially dismantled condition or has no apparent intrinsic value to the rightful owner.

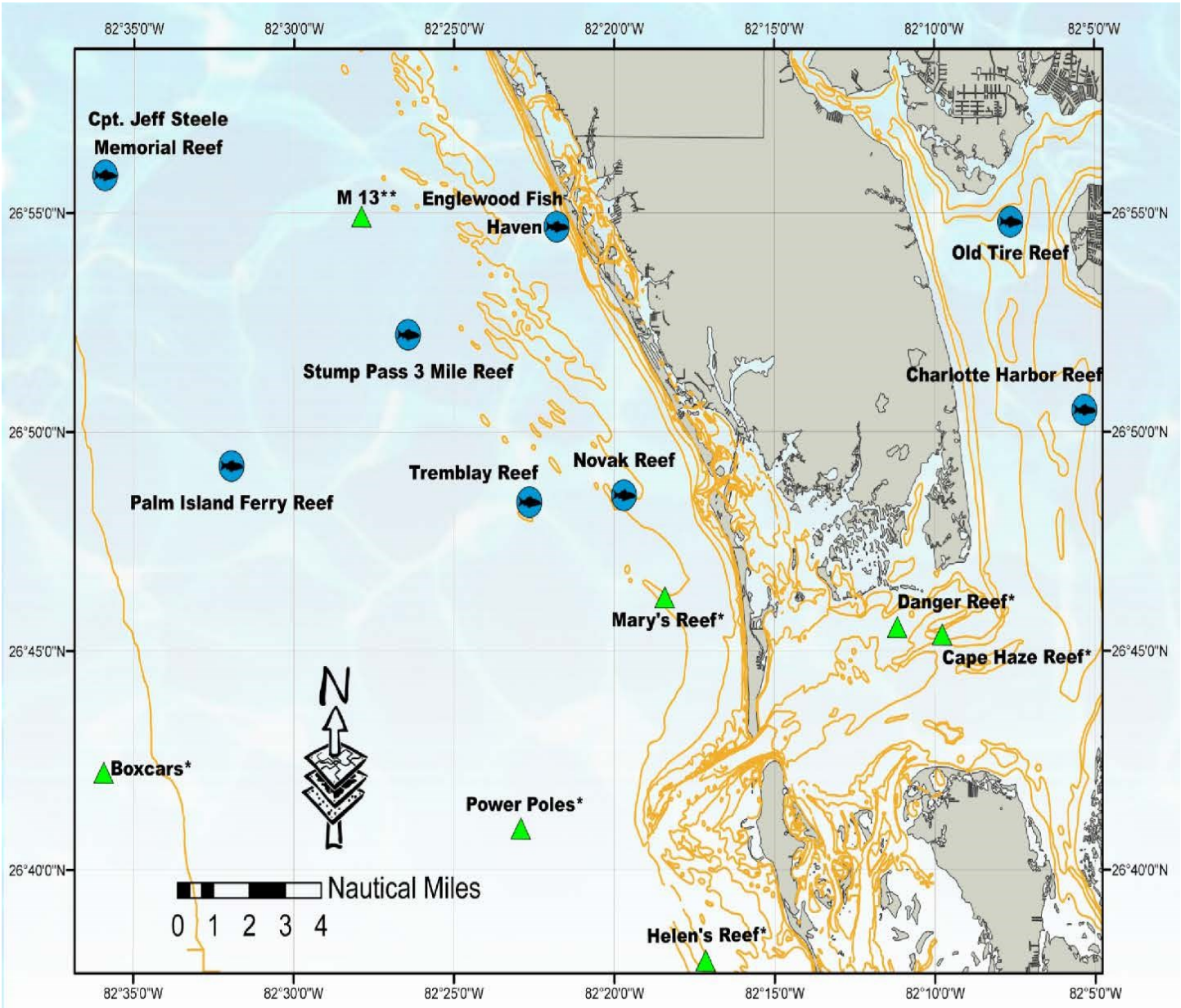
Derelict and abandoned vessels that are stored or moored for long periods of time in one location can have many negative effects. Vessels that are not properly maintained can be a major source of pollution. Oil, gas, and sewage can all leak into the aquatic environment as the vessel deteriorates. Vessels stored or moored for long periods of time in one place contribute to the demise of benthic fauna and flora as they restrict essential lighting for growth and sustained life. In addition to environmental risks, these vessels pose health risks to boaters and swimmers. Abandoned vessels can become obstructions to other vessels by blocking navigable channels or by debris that can come from the vessel as a result of damage from storms. This debris is often hard to stop while boating, but can cause major damages to vessels and risk the lives of those involved in any collision. Derelict and abandoned vessels are unsightly and may deter visitors from the areas.

The Charlotte County Board of County Commissioners approved a Charlotte County Code change that allowed the County to assist and facilitate the removal of abandoned vessels under Florida Statute. Charlotte County with the help of Charlotte County Sheriff's Office Marine Division, Florida Fish and Wildlife Conservation Commission's Department of Law Enforcement, and the Punta Gorda Police Department's Marine Section patrols to keep Charlotte County Waterways open and clear for all to enjoy.

Artificial Reefs Program

Artificial reefs are manmade underwater structures used to promote marine life development in areas that generally do not contain underwater structures. These manmade structures provide a stable growing area for corals, and a habitat for fishes and other marine organisms. In 1960, a local fishing club in Charlotte County deployed the County's first artificial reef. This reef is located off of Englewood Beach. In 1982, Florida created the Artificial Reef Program to assist local governments in building artificial reefs. From the early 1980s to 2008, the local Sea Grant Agent assisted Charlotte County government in developing and implementing the Artificial Reef Program. In 2009, the program became the responsibility of Charlotte County's Parks and Natural Resources Division. Currently, Charlotte County has eight artificial reefs. The locations of these artificial reefs can be found on the map below.

Artificial reefs provide numerous benefits in addition to promoting marine life development. Additional benefits that artificial reefs provide to Charlotte County include enhancing recreational and diving opportunities, providing socio-economic benefits to our community, replacing damaged habitat, and offering shoreline protection and hardbottom stabilization.



Artificial reefs are deployed under general guidelines established by FWC specified within the State of Florida Artificial Reef Strategic Plan, and are approved by regulatory agencies including the U.S Army Corps of Engineers and Florida Department of Environmental Protection. The regulatory agency review insures that artificial reefs are not placed on sensitive habitat or in areas that pose a navigational hazard. The Florida Fish and Wildlife Conservation Commission assists with funding of artificial reef projects using revenue generated from the state saltwater fishing license revenue and federal sport fish restoration funding.

Coastal Construction & Shoreline Protection Program

The Coastal Construction Control Line (CCCL) Program established by the Florida Department of Environmental Protection regulates structures and activities which can cause beach erosion, destabilize dunes, damage upland properties, or interfere with public access. CCCL permits also protect sea turtles and dune plants. Proposed development within the coastal building zone, coastal barrier islands, sea turtle lighting zone and seaward of the CCCL requires additional consideration and review during the permitting process. Charlotte County code also regulates the operation of motorized vehicles on shorelines, dune walkover structures, artificial shoreline stabilization structures, and dune restoration and stabilization projects. Any proposed development must comply prior to the issuance of building permits. In addition to the costal protections established by the state, the Charlotte County Sea Turtle Protection Ordinance provides standards and criteria for the protection of sea turtles nesting, costal development and prohibition of artificial lighting within the nesting zone during nesting season. Staff reviews applicable permits that fall within the Sea Turtle protection overlay to ensure all development complies with the ordinance.

Protection of Beach Nesting Birds

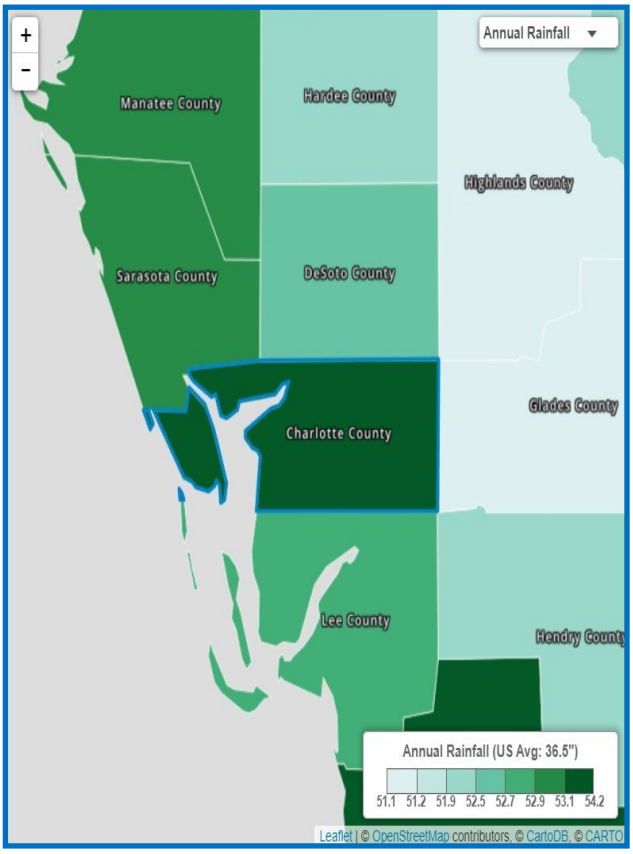
Beach nesting birds observed on Charlotte County beaches include American Oystercatcher, Black Skimmer, Least Tern, Snowy Plover, and Wilson's Plover. With widespread coastal development and natural habitat changes, shorebirds are being forced to compete for suitable habitat to incubate and raise their young. Charlotte County staff and volunteers, work with local and regional partners to protect beach nesting birds. Each year, historically documented shorebird nesting sites at Charlotte County beaches are roped off and posted to promote successful nesting. Monitors known as "shorebird stewards" walk the beaches regularly to document nesting activity and ensure that nesting sites are properly protected. To aid in protecting shorebirds and seabirds, Charlotte County also conduct educational outreach to inform the general public about shorebird nesting activities, and what they can do to promote successful nesting while going about their recreational activities. Every year staff conducts management at the Palm Island Shorebird Mitigation site. This ±4 acre site was a requirement of the county beach renourishment permit and is required to be annually maintained for optimal shorebird nesting. Management consists of a multi-tiered approach in order to minimize vegetation re-growth throughout nesting season. The site is then roped off to keep people from entering the nesting area. Trail cams are also set up in various locations so staff can monitor the site for predators.

Environment Benefits

Charlotte County contains a wide variety of habitats, wildlife, and plant species. This diversity is reflected in the County's parks and preserves. This diversity in habitats, fauna, and flora, means that the parks and preserves provide an assortment of environmental benefits to the county and Southwest Florida. These include stormwater mitigation, water filtration and water quality improvements, reduction of heat islands, biological diversity, reduction of nuisance pest activities, air pollution removal, and environmental education opportunities. The sections below provide details on how each of those benefits are achieved within the Charlotte County parks and preserves. and

Table #8. Climate Averages

Event	Charlotte County, FL	United States
Rainfall	51.4 inches	36.5 inches
Rainfall	100.9 days	106.2 days
Sunny	266 days	205 days



Additionally the sections below highlight how Charlotte County Parks and Natural Resources Division is meeting the objectives of the NRPAs Conservation Pillar and FRPAs Environmental Pillar. These pillars place value on creating green spaces that improve coastal resiliency and water quality, reduce flood risk, shield from extreme heat, provide cleaner air, and enhance wildlife habitat.

Stormwater Mitigation and Coastal Resiliency

Coastal ecosystems and wetlands can be very effective in reducing the risk of damage during storm events. Coastal wetlands such as salt marshes, mangrove swamps, and reefs serve as critical buffers against damage to property and infrastructure caused by hurricane surges and wave damage from storms. Both coastal and inland wetlands also help to mitigate damage from flooding by providing storage for flood waters. It is estimated that one acre of wetlands can store anywhere between 1 to 1.5 million gallons of flood water.

Mangrove swamps, also improve long-term resilience by stabilizing shorelines and protecting from erosion. This resilience aids in minimizing storm damage and provides for quicker recover following a natural disaster such as a tropical storm or flood. Depending on the severity of an event, rebuilding and recovery can typically take months or even years.

Waterfront parks have been identified as a method to address the impacts of sea level rise and make coastal communities more resilient. Waterfront parks are communal recreational spaces that can be flooded with minimal damage during storm or flood events. As such these parks provide a buffer to residential and commercial areas. When wetlands are incorporated into these waterfront parks, they can be used to divert flood water to other areas if necessary.

The SWFWMD FLUCFCS mapping for the Charlotte County parks and preserves identifies approximately 300± acres of coastal wetlands habitats. These 300 acres of coastal parklands assist in shoreline stabilization and buffer adjacent residential and commercial areas from storm damage. Additionally, approximately 1,600 acres of parks and preserves are waterfront and serve as buffers to storm damage and promote coastal resiliency.

Additionally, the Charlotte County parks and preserves include over 1,600 acres of wetlands as identified by the NWI mapping. According to EPAs 2001 estimate on floodwater storage capacity in wetlands, these wetlands have the potential to store between 1.6 to 2.4 million gallons of floodwater.

Cost Savings from Stormwater Mitigation

The Florida Parks and Recreation Association Impact Calculator was used to calculate the impact of Charlotte County green spaces on stormwater mitigation. The number of acres that encompass all of Charlotte County Parks and Natural Resources was totaled and a cost to manage stormwater of $0.04 cost/cubic foot was used for final calculations. The result of this calculation concluded that the 5,100 acres that make up Charlotte County parks and preserves mitigate approximately **727,952,591** gallons of stormwater annually, which saves Charlotte County **$3,892,524**.

Flood insurance can be costly for landowners, so Charlotte County looks for ways receive discounts in the Community Rating System (CRS) review process, administered by the Federal Emergency Management Agency (FEMA). The CRS review process provides flood insurance discounts to communities who take steps to reduce their flood risk by addressing the three goals of the CRS program. The three goals include, reduce and avoid flood damage to insurable property, strengthen and support the insurance aspects of the National Flood Insurance Program (NFIP), and foster comprehensive floodplain management.

Flood insurance premium rates in Community Rating System communities are discounted in increments of 5 percent. A Class 10 community is not participating in the CRS and receives no discount. A Class 9 community receives a 5 percent discount for all policies in its Special Flood Hazard Areas, a Class 8 community receives a 10 percent discount, all the way to a Class 1 community, which receives a 45 percent premium discount. Classifications are based on 19 creditable activities, organized in four categories, which include, Public Information, Mapping and Regulations, Flood Damage Reduction, and Warning and Response.

In the State of Florida, 243 communities participate in the FEMA CRS review process. Charlotte County has continued to participate in the FEMA CRS review process since 1992 and currently has a Class Rating of 6. This Class Rating means that the County receives a 20 percent premium reduction for Special Flood Hazard Areas (SFHA) and a 10 percent premium reduction for Non-SFHA. The average Class Rating of the 243 participating communities in Florida is 7.

Charlotte County Community Services Parks and Natural Resources Division has worked diligently to meet the goals of the CRS program in order to lower our CRS Class Rating and benefit our residents. In the last several years, Charlotte County has acquired approximately 2,534 acres of natural habitats and wetlands to be preserved as green spaces. County owned lands such as our parks and natural resource facilities are a vital component of the flood protection system and provide our community with great financial savings.

Water Quality/Water Filtration

Stormwater runoff picks up and carries untreated water that contain pathogens, nutrients, sediment, and heavy metals into our local waterways. Our parks and preserve facilities acquired and maintained by Charlotte County Parks and Natural Resources Division provide pervious surfaces, also known as green spaces, that retain rainwater and allow stormwater to infiltrate directly into the soil instead of running directly into our waterways. By retaining rainfall from storms, stormwater discharge volumes are decreased, which results in reduced combined sewer overflows and lower pollutant loads. These green spaces assist Charlotte County in meeting regulatory requirement by assisting in managing stormwater and reducing pollution.

Charlotte County parks and preserve facilities perform a vital role in recharging Florida's aquifers by allowing stormwater infiltration. Florida's aquifers supply more than 8 billion gallons of water each day and are responsible for supplying approximately 90 percent of the State's drinking water.

Prevention of Flooding

Charlotte County is at a high risk for flooding due to its proximity to the coast and its numerous waterways. As you can see on the Charlotte County Flood Zone Map, a large portion of the county falls under flood zones VE, AE, and D. According to the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program, any building located in a V or A zone is considered to be in a Special Flood Hazard Area and is lower than the base flood elevation. Flood zone D are areas that have not been studied, but where flooding is possible. Table #9 shows some of the most devastating major flooding events to happen to Charlotte County. The seven major flood events that date from 1999 to 2017 resulted in a total of over **$5.4 billion** in damages to County infrastructure, homes, and businesses.

The damage caused by these major flood events would have been far greater if not for Charlotte County parks and preserves facilities. Runoff from adjacent developed land that typically drain directly into piped collection systems and overrun the systems are directed towards the pervious spaces. The green spaces provide areas for stormwater to infiltrate into the ground instead of lingering in our roads, sidewalks, parking lots, and other impervious areas making it impossible to travel and costing expensive damages. Having water directed towards the parks and preserves also greatly saves irrigation cost for parks, which saves money for other facility improvements that further enhance the community as previously mentioned under "Cost Saving from Stormwater Mitigation."

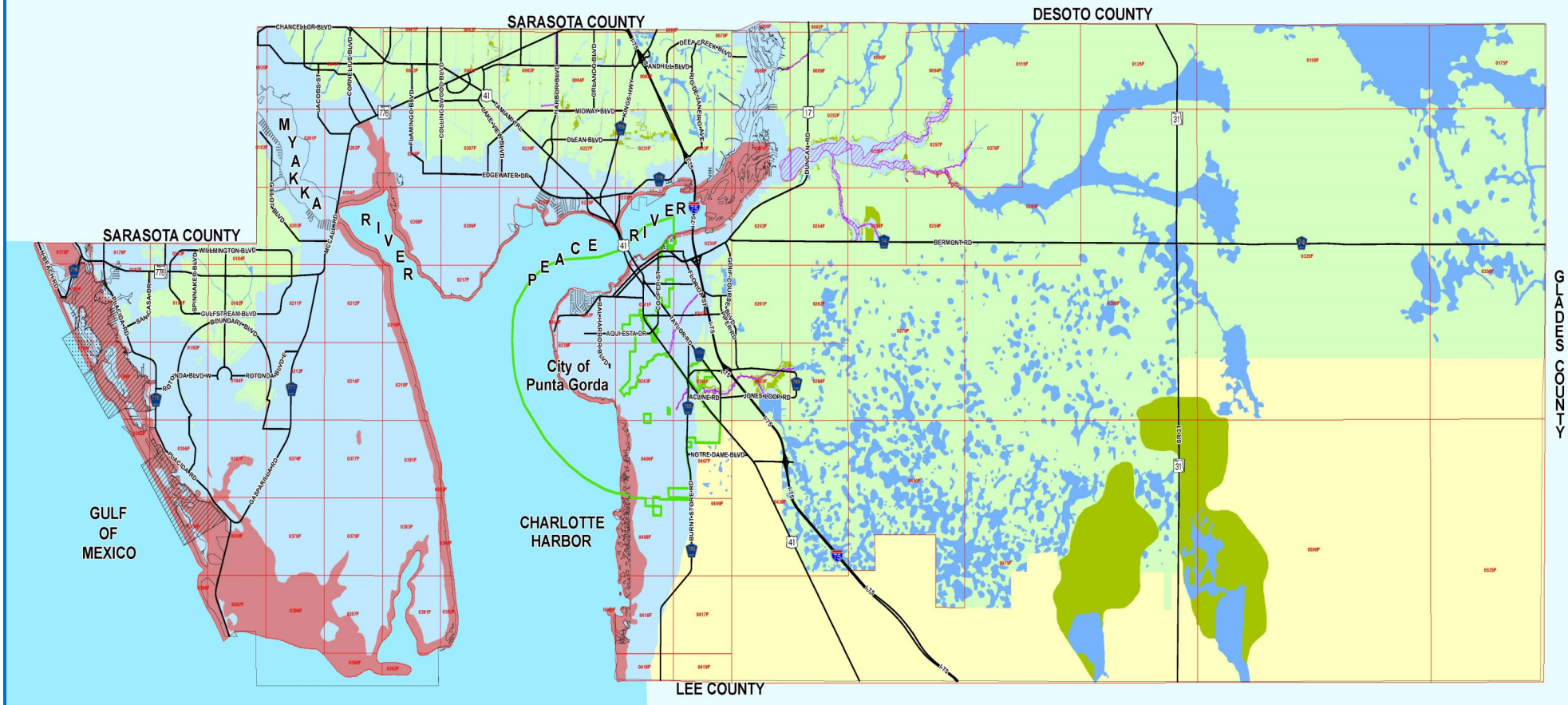
Table #9. Charlotte County Flood History

Flood Event	Description of Event
September 2017 Hurricane Irma	Estimated $5 to $6 million in damage to private and public resources caused by this powerful hurricane hitting Charlotte County as well as the majority of the State.
October 2005 Hurricane Wilma	Heavy rains of 4 to 8 inches caused urban street flooding and filled ditches to capacity.
August 2004 Hurricane Charley	Estimated $5.4 billion in damage to private and public resources caused by this powerful category 4 hurricane hitting Charlotte County and proceeding up the harbor to Desoto County.
June 2003 Excessive Rainfall	Between 16" and 20" of rain fell across the county within a 24-hour period. Approximately $4.7 million in damages occurred to public infrastructure. 41 living units were affected with an estimated $50,000 in damage.
September 2001 Tropical Storm Gabrielle	Direct hit from tropical storm caused widespread flooding along Shoreview Drive and Gulf Blvd. Significant flooding also took place in the City of Punta Gorda. Over 300 homes were affected with minor-moderate levels of flooding. Estimated damages to infrastructure, residences, and businesses are between $4-6 million.
September 2000 Hurricane Gordon	Passing Hurricane caused flooding in the Manasota Key area along Shoreview Drive and Gulf Blvd. Other areas included the Peace River shoreline area in Punta Gorda. Flood Insurance claims totaled over $132,584.02.
September 1999 Tropical Storm Harvey (No Landfall)	Passing tropical storm caused flooding in the Manasota Key area along Shoreview Drive and Gulf Blvd. Minor flooding occurred in a few homes. Flood Insurance claims were totaled over $21,592.40.

CHARLOTTE COUNTY

Flood Insurance Rate Map (FIRM)

CHARLOTTE COUNTY
Community Development



FEMA Zones

Stateplane Projection
Datum: NAD83
Units: Feet

Source: CCGIS, FEMA

Metadata available upon request

- VE Zones
- AE Zones
- A Zones
- D Zones
- X Zones
- X Zones (0.2% annual chance flood)
- Coastal Barrier Resources System (CBRS) Area
- Otherwise Protected Area (OPA)
- Floodway Areas in Zone AE
- City of Punta Gorda
- FIRM Panel

N
W E
S

(Not to Scale)

Updated: 6/5/2019 1:44:18 PM by: D. Vance - 2864
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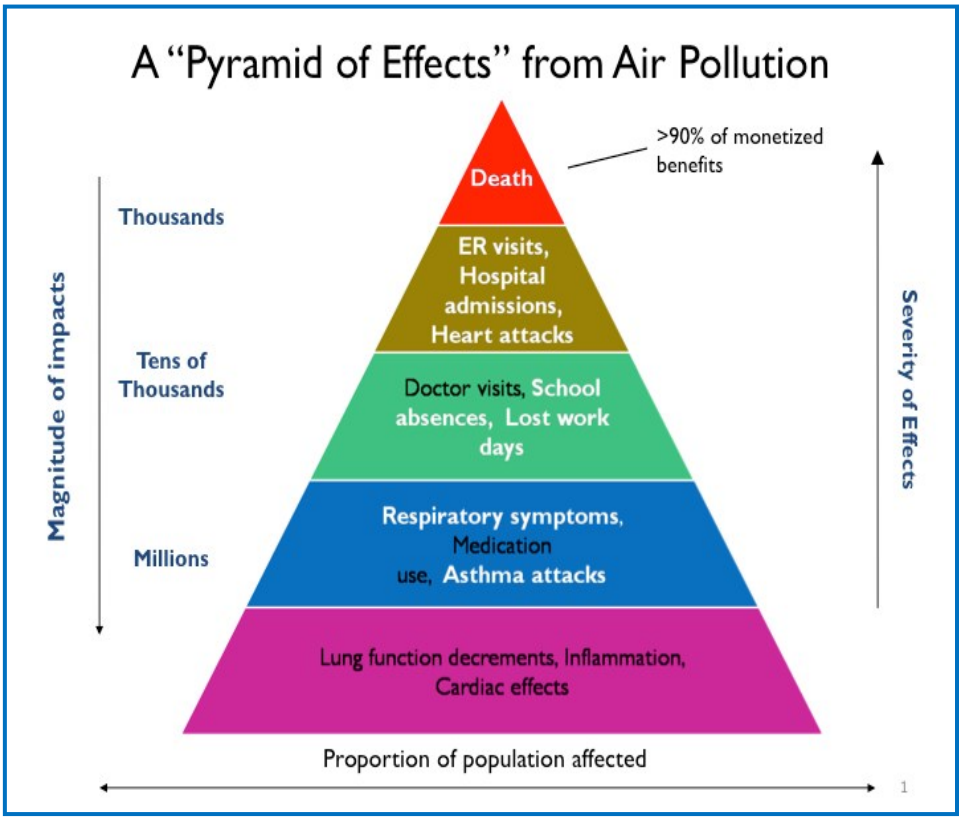
Mosquito Control

Charlotte County parks and preserves play a major role in limiting mosquito activity. Mosquito-borne diseases continue to pose a major threat to human and animal health and are spread through the bite of mosquitoes. Mosquito-borne diseases found in Florida include Chikungunya, Dengue, Dog Heartworm, Eastern equine encephalitis, St. Louis encephalitis, West Nike fever and West Nile encephalitis, and Zika. All mosquitoes require water for their offspring to develop and this water is often flood waters that could not drain properly due to poor stormwater management. Thankfully, with the green spaces at Charlotte County Parks and Natural Resource, standing water is typically present for less than 72 hours, which is much shorter than the time needed for mosquitoes to develop from larvae to adults. The pervious areas provided by parks ensures that water is infiltrated quickly enough to limit mosquito activity and development. The quick removal of stormwater provided by Charlotte County parks and preserves also reduces the need for insecticides which benefits the health and safety of all users, as well as the environment.

Air Pollution Removal



Charlotte County parks and preserves encompass over 5,100 acres available for recreation and social opportunities. Charlotte County works diligently to protect, restore, and conserve our great environmental resources. Charlotte County parks and preserves serve to mitigate climate changes that include modified temperatures, wind, rain, and air quality patterns. In one year, an acre of forest can absorb twice the carbon dioxide produced by the average car's annual mileage. The thousands of trees throughout Charlotte County facilities play a vital role in preserving our community. Additional air pollutants that are removed by the vegetation at Charlotte County parks and preserves include carbon monoxide, nitrogen dioxide, ozone, coarse dust particles, fine particles, and sulfur dioxide.

Reduction of Heat Islands

Heat islands are urbanized areas that experience higher temperatures than outlying areas. Tree shading produces substantial environmental benefits in the form of reduced surface temperatures. Tree shading has been known to reduce surface temperatures on building walls and rooftops by as much as 45°F, and can further reduce solar gain through windows to reduce interior temperatures.

At a larger scale, urban forests also contribute to regional cooling and can therefore reduce carbon emissions. One study estimated that the average annual savings per tree was 36 kWh of cooling energy. Savings in warmer urban, like southwest Florida, has been estimated to be up to 96 kWh per tree. This evidence suggests that tree planting at any scale can have significant benefits on both the local and regional scale.

Parks and open greenspace can also provide cooling through evapotranspiration rather than shading. The open greenspace of urban parks can produce an "oasis effect" with much cooler temperatures within them compared to the surrounding urban area. The magnitude of this effect can range from roughly 2.7 to 7.2°F. This cooling effect can also extend beyond the park's boundary. Even small urban greenspaces have been observed to have a significant difference in local temperature. One study found that small urban parks can having a cooling effect of up to 12°F.

In contrast to cooling provided by tree canopy, parks often provide greater cooling benefits during the night than during the day. These cooling rates are accelerated if the park is irrigated. As previously noted, the cooling effect, both during the day and night, has been found to extend outside of the park itself. While the magnitude of the cooling effects of parks are found to drop off exponentially as distance increases, cooling has been observed to extend as far as 840 meters (0.52 miles) from a park boundary. The cooling extent is heavily dependent on factor such as wind patterns and topography.

Charlotte County parks and preserves provide a combination of both tree canopy cover and open greenspaces. The SWFWMD FLUCFCS mapping for the Charlotte County parks and natural resources identifies 1,904.79± acres of forested habitat types. In addition, approximately 1,400 acres could be classified as open greenspace. In total over 3,300± acres of forested and greenspace areas provide cooling effects within their limits and to adjacent communities. According to the EPA, shaded areas could see a decrease in peak temperatures by 20-45 degrees Fahrenheit.

Biological Diversity

Southwest Florida and Charlotte County is home to many state and federally listed species. Parks and natural resources are important as biodiversity hotspots within urban areas. Parks and preserves can harbor rare and listed species. Parks and natural preserves help to protect populations of vulnerable species by providing refuge, foraging, or nesting/denning habitat. The location of the parks and preserves may also deem them as components of dispersal corridors needed for habitat connectivity among populations.

Biodiversity helps to protect the resiliency of communities. This benefit includes commercial and recreational fisheries that are valuable to the County and its residents, and state and federally listed species. As previously indicated, Charlotte County parks and preserves have the potential to provide support of 32 state and federally listed species of wildlife and 32 species of plants listed by FDACS. In fact, Charlotte County Parks and Natural Resources Staff have confirmed observations of several of these species, including but not limited to, eastern indigo snake, gopher tortoise, Florida Scrub-Jay, bald eagle, crested caracara, Florida panther, American kestrel, roseate spoonbill, little blue heron, and American alligator.

Conservation

Charlotte County's Parks and Natural Resources Division help to protect both state and federally listed species and the lands that are essential to their survival. Some of the ways that Charlotte County protects these species is by acquiring conservation lands, managing natural habitats, species monitoring, coordination with other conservation programs, and ensuring state and federal permitting requirements are met.

The conservation measures describe below also highlight how Charlotte County Parks and Natural Resources Division is fostering environmental stewardship through passive use of sensitive lands as well as conserving and managing habitats for future generations in accordance with the objectives of the FPRA and NRPA Pillars.

Acquiring Environmentally Sensitive Lands

Based on data prepared by the Florida Legislature Office of Economic and Demographic Research, Charlotte County has seen a 16.8% population increase from 2010 to 2020. Based on United States Census Bureau Estimates and Projections, Charlotte County is projected to see a population growth of 14.7% from 2020 to 2030 or a population growth of 24.7% from 2020 to 2040. As the population of Charlotte County continues to increase, the need for more infrastructure increases as well. However, with increasing population and infrastructure, the importance of protecting and acquiring environmentally sensitive lands to balance the impacts of future growth is emphasized. As previously mentioned in this report, green spaces perform services for us that include improving water quality, preventing flooding, recharging our aquifer, removing air pollution, reducing heat islands, and providing open spaces and recreational opportunities. By acquiring, protecting, and preserving environmentally sensitive lands, we are able to help keep Charlotte County unique and beautiful, and avoid future infrastructure cost.

On November 7, 2006, Charlotte County citizens voted to tax themselves for the purchase of environmentally sensitive lands. They approved a referendum authorizing the County to issue up to $77 million in bonds to purchase environmentally sensitive lands. The bonds are paid for by a .20 mil ad valorem tax, equal

Table #10. Charlotte County Population Growth

Census Year	Charlotte County Population
2000	141,627
2010	159,978
2020	186,847
2030	215,478
2040	234,391

Table #11. Charlotte County Environmental Lands

Amberjack Environmental Park
Ann and Chuck Environmental Park
Bill Coy Preserve
Cedar Point Environmental Park
Charlotte Flatwoods Environmental Park
Deep Creek Preserve
Myakka River Park
Oyster Creek Regional Park
Peace River Preserve
Prairie Creek Preserve
Shell Creek Preserve
Thornton Key Preserve
Tippecanoe Environmental Park
Tippecanoe II

to about 20 cents on every $1,000 of tax assessed land value. The tax will be levied annually for 20 years until 2027. All funds raised by these bonds are used to buy and manage environmental lands and open spaces. These lands are held in preservation for public use.

Charlotte County Scrub-Jay Habitat Conservation Plan

The Charlotte County Scrub-Jay Habitat Conservation Plan (HCP) was developed as part of an application for an Incidental Take Permit (ITP) to address construction and development related impacts within the County to the Florida Scrub-Jay (*Aphelocoma coerulescens*) and Eastern indigo snake (*Drymarchon corais couperi*) which are state and federally threatened species. The HCP provides measures to ensure Scrub-Jays continue to reside within Charlotte County, including the designation and protection of the Scrub-Jay Reserve totaling approximately 4,500 acres. The Reserve was designated under the HCP to serve as compensation for loss of occupied Scrub-Jay habitat. An objective of the HCP is to acquire a minimum of 1,300 acres identified within the Reserve. County acquisition, restoration, and long-term management of lands within the Reserve has been conducted through the HCP process to provide mitigation and compensation for impacts to occupied Scrub-Jay habitat.

Charlotte County Manatee Protection Plan

The Charlotte County Manatee Protection Plan (MPP) was approved by the Florida Fish and Wildlife Conservation Commission (FWC) July 2017, the Fish and Wildlife Service (FWS) September 2017 and adopted by the Charlotte County Board of County Commissioners (BCC) May 2018. The principal objective of the MPP is to provide predictable and expanded options for development, while aiding in the long-term viability of manatees within Charlotte County. The MPP establishes a guideline by which state wildlife and regulatory agencies, federal wildlife and regulatory agencies, local entities and applicants can utilize to review new or expanding slips or boat facilities in an expedited manner. Along with guidance for future water-related development, the MPP also provides recommendations for future habitat protection measures, educational efforts, and law enforcement initiatives, including the pursuit of appropriations and grant funding.

Charlotte County Sea Turtle Protection Plan

In May 1989, and later amended in June 1998, Charlotte County adopted a Sea Turtle Protection Ordinance (Article XII) which provides standards and criteria for the protection of sea turtle nesting, coastal development, and prohibits artificial lighting on the nesting zone during the nesting season. In 2005, The Sea Turtle Management Plan was developed to provide clarification and supplemental information on Article XII, Sea Turtle Protection Ordinance. It is the intent of this management plan to provide a balance between the needs of residents and visitors and threatened and endangered sea turtles. This document is also designed to provide the beachfront community a greater understanding of how the County will implement the sea turtle ordinance.

Conclusion

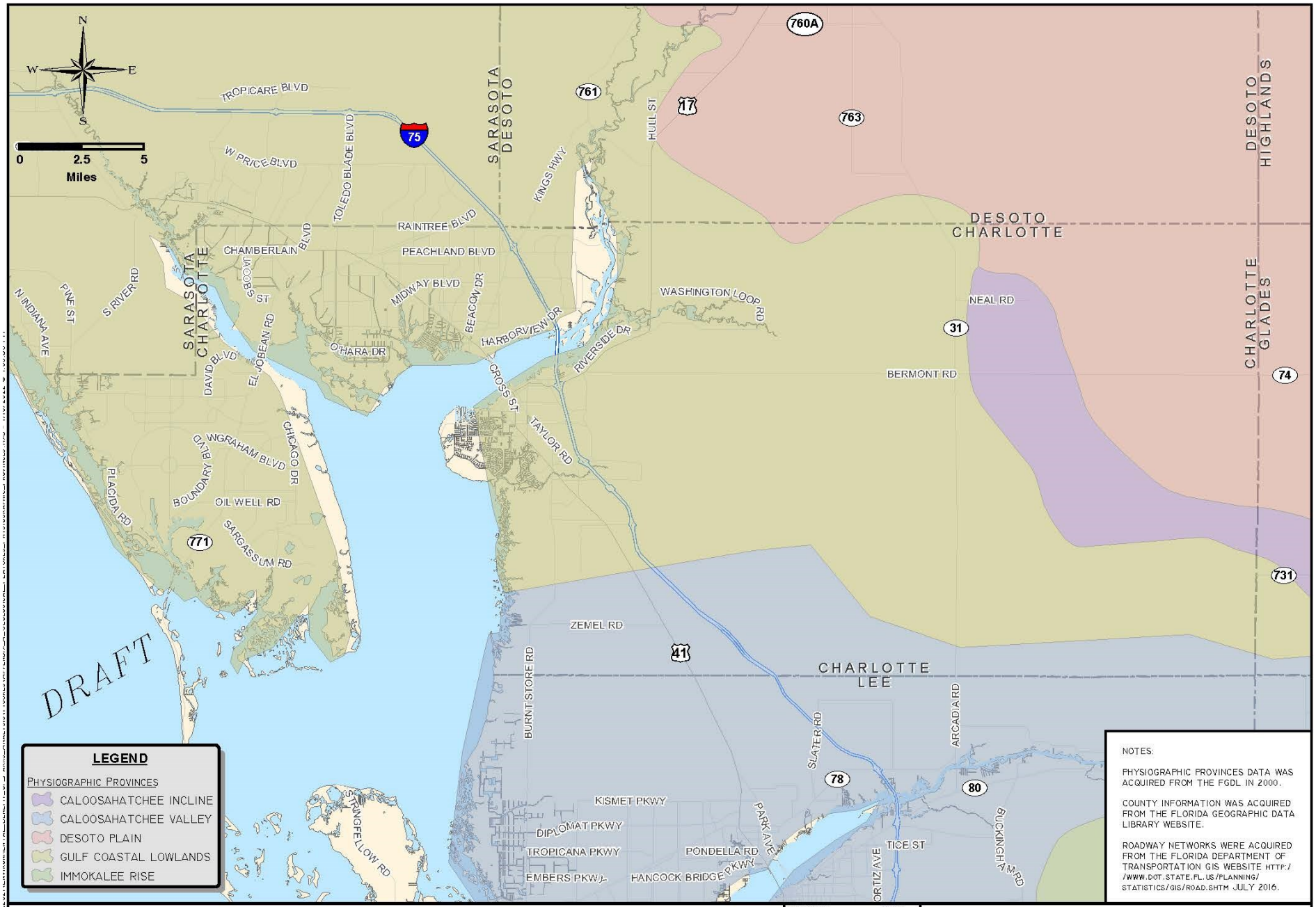
Charlotte County Community Services Parks and Natural Resources Division offer a variety of opportunities for people of all ages, income levels, race, religion, gender, and physical abilities to interact, learn, and grow, contributing to a community that is stronger, safer, and more successful. This report illustrates that Charlotte County's parks and natural resources are key economic drivers that contribute millions in economic benefits. The 5,100 acres that make up Charlotte County parks and natural resources annually mitigates approximately **727,952,591** gallons of stormwater which saves **$3,892,524** each year, and can prevent millions of dollars worth of damage from severe storms. As shown in this report, close proximity to these facilities can cause an increased home value of **$7,000-$8,000**. These facilities attract visitors that often end up spending considerable amounts of money on food, entertainment, fuel, gifts, lodging, and other local assets.

Charlotte County Parks and Natural Resources Division encourages a healthy, active lifestyle. Our facilities provide the opportunity for citizens to control their weight, strengthen their bones and muscles, and reduce their risk of cancers, cardiovascular diseases, and type-2 diabetes. Parks also improve your mental health and mood. Participating in recreation activities and being outdoors in nature has been shown to reduce anxiety and depression. Being in nature can also increase your sense of balance, self-esteem, and connection to your community.

Community cohesion is essential for a community to thrive. Charlotte County Parks and Natural Resources Division are one of our counties most effective assets to change the character and improve the image of our community. Parks and natural resources provide areas for people to meet and play in a safe open space, specifically designed for their enjoyment and safety. When people are brought together, they can have a powerful positive influence on our community, especially through donated volunteer time and financial contributions. With the assistance of our residents, Charlotte County Community Services Parks and Natural Resources Division continues to maintain and improve our parks and preserves to best meet the needs all visitors to further strengthen our strong and growing community.

Charlotte County contains rare and unique species of plants and wildlife, many of which are state or federally listed species. Charlotte County Parks and Natural Resources Division acquires and manages environmental sensitive habitat for the benefit of wildlife and protection of biodiversity. This includes management of invasive species, implementing controlled burns and managing human-wildlife interactions through the implementation of programs such as the artificial reef program, beach nest bird monitoring and the CCCL program. These measure help to preserve these rare and unique species and resources for future generations.

Appendix A:
Geological Features: Physiographic Provinces

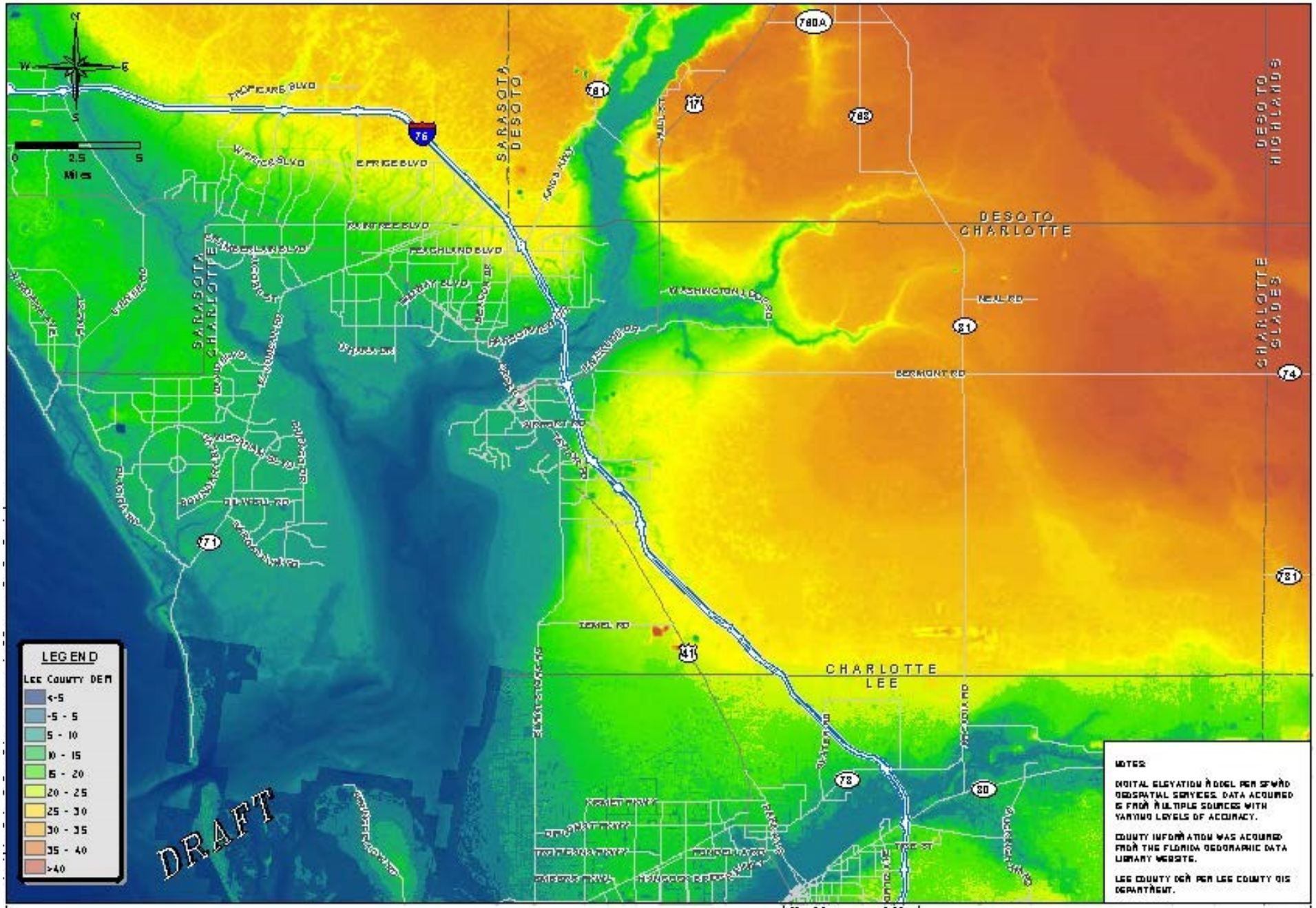


APPENDIX A. GEOLOGICAL FEATURES: PHYSIOGRAPHIC PROVINCES
CHARLOTTE COUNTY BENEFIT OF PARKS

DRAWN BY	DATE
H.H.	12/20/21
REVIEWED BY	DATE
H.S.	12/20/21
REVISED	DATE

PASSARELLA & ASSOCIATES, INC
Consulting Ecologists

Appendix B:
Topography Map



APPENDIX B. TOPOGRAPHY MAP
CHARLOTTE COUNTY BENEFIT OF PARKS

H.H.	12/20/21
H.S.	12/20/21

PASSARELLA & ASSOCIATES

Appendix C:
Charlotte County Parks and Preserves
Soils

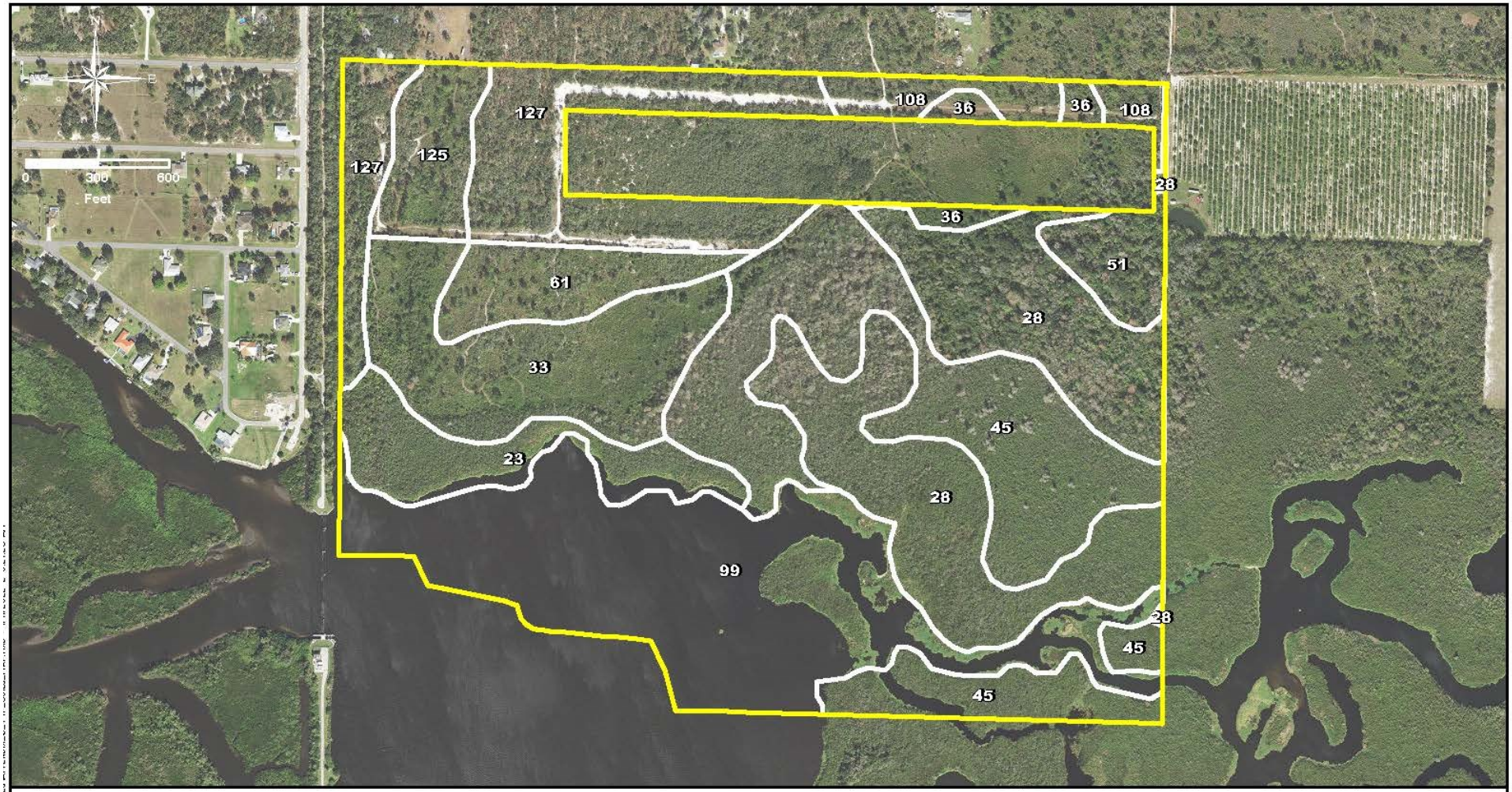
Charlotte County Parks and Preserves Soils

Soil Map Unit	Soil Name	Hydric Status	Acreage	Percent
2	Canaveral fine sand, 0 to 2 percent slopes	Yes	18.79	0.32%
4	Canaveral fine sand-Urban land complex, 0 to 2 percent slopes	Unranked	7.72	0.13%
6	Hallandale fine sand, wet, 0 to 2 percent slopes	No	15.30	0.26%
7	Matlacha gravelly fine sand-Urban land complex, 0 to 2 percent slopes	Unranked	194.69	3.31%
9	EauGallie sand, 0 to 2 percent slopes	No	67.23	1.14%
11	Myakka fine sand, 0 to 2 percent slopes	No	309.49	5.25%
12	Felda fine sand, 0 to 2 percent slopes	Yes	24.18	0.41%
13	Boca fine sand, 0 to 2 percent slopes	Yes	22.14	0.38%
14	Valkaria fine sand, 0 to 2 percent slopes	Yes	0.02	0.00%
15	Estero muck, tidal, 0 to 1 percent slopes	Yes	33.70	0.57%
16	Peckish mucky fine sand, tidal, 0 to 1 percent slopes	Yes	22.33	0.38%
17	Daytona sand, 0 to 5 percent slopes	No	20.55	0.35%
22	Beaches	Unranked	5.72	0.10%
23	Wulfert muck, tidal, 0 to 1 percent slopes	Yes	277.23	4.71%
24	Kesson fine sand, tidal, 0 to 1 percent slopes	Yes	55.09	0.94%
25	St. Augustine, organic substratum-Urban land complex, 0 to 2 percent slopes	Unranked	0.79	0.01%
26	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	Yes	296.76	5.04%
27	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	Yes	34.74	0.59%
28	Immokalee sand, 0 to 2 percent slopes	No	482.89	8.20%
29	Punta fine sand, 0 to 2 percent slopes	No	20.60	0.35%
33	Oldsmar sand, 0 to 2 percent slopes	Yes	773.15	13.13%
34	Malabar fine sand, 0 to 2 percent slopes	No	84.83	1.44%
35	Wabasso sand, 0 to 2 percent slopes	No	238.67	4.05%
36	Immokalee sand-Urban land complex, 0 to 2 percent slopes	Yes	176.35	2.99%
40	Anclote sand, frequently ponded, 0 to 1 percent slopes	Yes	22.11	0.38%
42	Wabasso sand, limestone substratum, 0 to 2 percent slopes	Yes	262.36	4.45%
43	Smyrna fine sand, 0 to 2 percent slopes	No	313.02	5.31%
44	Malabar fine sand, frequently ponded, 0 to 1 percent slopes	Yes	6.26	0.11%
45	Copeland fine sandy loam, frequently ponded, 0 to 1 percent slopes	Yes	35.07	0.60%

48	St. Augustine sand, 0 to 2 percent slopes	Yes	11.41	0.19%
49	Felda fine sand, frequently ponded, 0 to 1 percent slopes	Yes	21.21	0.36%
51	Floridana sand, frequently ponded, 0 to 2 percent slopes	Yes	4.27	0.07%
53	Myakka fine sand, frequently ponded, 0 to 1 percent slopes	Yes	31.40	0.53%
59	Urban land, 0 to 2 percent slopes	No	19.80	0.34%
61	Orsino fine sand, 0 to 5 percent slopes	No	464.17	7.88%
63	Malabar fine sand, high, 0 to 2 percent slopes	Yes	80.29	1.36%
64	Hallandale fine sand, wet-Urban land complex, 0 to 2 percent slopes	Yes	32.16	0.55%
67	Smyrna fine sand-Urban land complex, 0 to 2 percent slopes	Unranked	121.72	2.07%
69	Matlacha gravelly fine sand, 0 to 2 percent slopes	No	15.46	0.26%
70	Heights fine sand, 0 to 2 percent slopes	No	6.81	0.12%
73	Pineda fine sand, frequently ponded, 0 to 1 percent slopes	Yes	27.22	0.46%
76	Electra fine sand, 0 to 2 percent slopes	No	150.83	2.56%
99	Water	Unranked	101.30	1.72%
100	Waters of the Gulf of Mexico	Unranked	50.21	0.85%
102	Boca fine sand-Urban land complex, 0 to 2 percent slopes	Yes	83.95	1.43%
103	Boca fine sand, tidal-Urban land complex, 0 to 2 percent slopes	Unranked	0.44	0.01%
105	Copeland fine sandy loam, ponded-Urban land complex, 0 to 1 percent slopes	Unranked	26.35	0.45%
106	Daytona sand-Urban land complex, 0 to 5 percent slopes	No	4.31	0.07%
107	EauGallie sand-Urban land complex, 0 to 2 percent slopes	No	39.83	0.68%
108	Electra fine sand-Urban land complex, 0 to 2 percent slopes	Yes	4.82	0.08%
109	Estero muck, tidal-Urban land complex, 0 to 1 percent slopes	Yes	3.85	0.07%
110	Felda fine sand-Urban land complex, 0 to 2 percent slopes	No	9.51	0.16%
111	Felda fine sand, ponded-Urban land complex, 0 to 1 percent slopes	Yes	21.29	0.36%
112	Floridana sand, ponded-Urban land complex, 0 to 1 percent slopes	Unranked	6.32	0.11%
117	Isles fine sand, flooded-Urban land complex, 0 to 1 percent slopes	Yes	151.93	2.58%
118	Kesson fine sand, tidal-Urban land complex, 0 to 1 percent slopes	Unranked	3.91	0.07%
119	Malabar fine sand-Urban land complex, 0 to 2 percent slopes	Unranked	19.32	0.33%
121	Malabar fine sand, high-Urban land complex, 0 to 2 percent slopes	Yes	4.23	0.07%

123	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	No	63.45	1.08%
124	Myakka fine sand, ponded-Urban land complex, 0 to 1 percent slopes	Unranked	15.53	0.26%
125	Oldsmar sand-Urban land, 0 to 2 percent slopes	Yes	120.11	2.04%
126	Oldsmar fine sand, limestone substratum-Urban land complex, 0 to 2 percent slopes	No	21.72	0.37%
127	Orsino fine sand-Urban land complex, 0 to 5 percent slopes	Unranked	25.00	0.42%
129	Pineda fine sand-Urban land complex, 0 to 2 percent slopes	Yes	43.44	0.74%
132	Pompano fine sand, ponded-Urban land complex, 0 to 1 percent slopes	Yes	1.72	0.03%
133	Punta fine sand-Urban land complex, 0 to 2 percent slopes	No	24.71	0.42%
134	Satellite fine sand-Urban land complex, 0 to 2 percent slopes	No	18.05	0.31%
135	St. Augustine sand-Urban land complex, 0 to 2 percent slopes	Yes	0.57	0.01%
136	Valkaria fine sand-Urban land complex, 0 to 2 percent slopes	Yes	16.41	0.28%
137	Wabasso sand-Urban land complex, 0 to 2 percent slopes	Unranked	23.93	0.41%
138	Wabasso sand, limestone substratum-Urban land complex, 0 to 2 percent slopes	No	175.24	2.98%
Total			**5,890**	**100.00%**

Appendix D:
Typical Soils Map



LEGEND

- Biscayne Conservation Easement
- Soils

Soil Unit	Description
23	Wulfert muck, tidal, 0 to 1 percent slopes
28	Immokalee sand, 0 to 2 percent slopes
33	Oldsmar sand, 0 to 2 percent slopes
36	Immokalee sand-Urban land complex, 0 to 2 percent slopes
45	Copeland fine sandy loam, frequently ponded, 0 to 1 percent slopes
51	Floridana sand, frequently ponded, 0 to 2 percent slopes
61	Orsino fine sand, 0 to 5 percent slopes
99	Water
108	Electra fine sand-Urban land complex, 0 to 2 percent slopes
125	Oldsmar sand-Urban land, 0 to 2 percent slopes
127	Orsino fine sand-Urban land complex, 0 to 5 percent slopes

DRAFT

NOTES:

PARKS PER THE CHARLOTTE COUNTY GIS WEBSITE.

SOILS MAPPING WAS ACQUIRED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE WEBSITE APRIL 2021.

APPENDIX C. TYPICAL SOILS MAP

CHARLOTTE COUNTY BENEFIT OF PARKS

DRAWN BY	DATE
H.H.	12/20/21
REVIEWED BY	DATE
H.S.	12/20/21
REVISED	DATE

Consulting Ecologists PASSARELLA & ASSOCIATES INC

Appendix E:
Soil Attributes

Appendix D. Soil Attributes (as Defined in The Soil Survey of Charlotte County (Henderson 1984))

Soil Map Unit	Soil Name	Acres	Physical Attributes		Biological Attribute: Potential for Wildlife Use In				Limitations for Recreational Use*
			Hydrologic Group	% Organic Matter	Open Land	Wood land	Wetland	Rangeland	
2	Canaveral fine sand, 0 to 2 percent slopes	18.79	C	<1	Poor	Poor	Very Poor	NR	Severe: wetness, too sandy
4	Canaveral fine sand-Urban land complex, 0 to 2 percent slopes	7.72	C	<1	Poor	Poor	Very Poor	NR	Severe: wetness, too sandy
6	Hallandale fine sand, wet, 0 to 2 percent slopes	15.30	B/D	2-5	Poor	Poor	Fair	Poor	Severe: wetness, too sandy
7	Matlacha gravelly fine sand-Urban land complex, 0 to 2 percent slopes	194.69	C	--	NR	NR	NR	NR	Severe: wetness, too sandy
9	EauGallie sand, 0 to 2 percent slopes	67.23	B/D	2-8	Poor	Poor	Poor	NR	Severe: wetness, too sandy
11	Myakka fine sand, 0 to 2 percent slopes	309.49	B/D	<2	Fair	Poor	Poor	NR	Severe: wetness, too sandy
12	Felda fine sand, 0 to 2 percent slopes	24.18	B/D	1-4	Fair	Poor	Fair	NR	Severe: wetness, too sandy
13	Boca fine sand, 0 to 2 percent slopes	22.14	B/D	1-3	Fair	Poor	Fair	Good	Severe: wetness, too sandy
14	Valkaria fine sand, 0 to 2 percent slopes	0.02	B/D	1-4	Poor	Poor	Good	NR	Severe: wetness, too sandy
15	Estero muck, tidal, 0 to 1 percent slopes	33.70	D	--	Very Poor	Very Poor	Good	NR	Severe: flooding, wetness, excess humus
16	Peckish mucky fine sand, tidal, 0 to 1 percent slopes	22.33	D	--	Very Poor	Very Poor	Fair	NR	Severe: flooding, wetness, too sandy, excess salt
17	Daytona sand, 0 to 5 percent slopes	20.55	B	5-10	Poor	Poor	Very Poor	NR	Severe: too sandy
22	Beaches	5.72	--	--	NR	NR	NR	NR	--

Soil Map Unit	Soil Name	Acres	Physical Attributes		Biological Attribute: Potential for Wildlife Use In				Limitations for Recreational Use*
			Hydrologic Group	% Organic Matter	Open Land	Wood land	Wetland	Rangeland	
23	Wulfert muck, tidal, 0 to 1 percent slopes	277.23	D	--	Very Poor	Very Poor	Fair	NR	Severe: flooding; wetness, excess humus, excess salt
24	Kesson fine sand, tidal, 0 to 1 percent slopes	55.09	D	--	Very Poor	Very Poor	Fair	NR	Severe: flooding, wetness, too sandy
25	St. Augustine, organic substratum-Urban land complex, 0 to 2 percent slopes	0.79	B	1-3	Very Poor	Very Poor	Poor	NR	Severe: flooding, wetness, excess salt
26	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	296.76	B/D	0.5-6	Fair	Poor	Fair	NR	Severe: wetness, percs slowly, too sandy
27	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	34.74	B/D	1-5	Very Poor	Poor	Good	NR	Severe: ponding, too sandy
28	Immokalee sand, 0 to 2 percent slopes	482.89	B/D	1-2	Poor	Poor	Poor	NR	Severe: wetness, too sandy
29	Punta fine sand, 0 to 2 percent slopes	20.60	B/D	1-4	Fair	Fair	Poor	NR	Severe: wetness, percs slowly, too sandy
33	Oldsmar sand, 0 to 2 percent slopes	773.15	B/D	1-2	Fair	Fair	Poor	NR	Severe: wetness, percs slowly, too sandy
34	Malabar fine sand, 0 to 2 percent slopes	84.83	B/D	1-2	Poor	Poor	Fair	NR	Severe: wetness, percs slowly, too sandy
35	Wabasso sand, 0 to 2 percent slopes	238.67	B/D	1-4	Poor	Fair	Poor	NR	Severe: wetness, percs slowly, too sandy
36	Immokalee sand-Urban land complex, 0 to 2 percent slopes	176.35	B/D	1-2	Poor	Poor	Poor	NR	Severe: wetness, too sandy
40	Anclote sand, frequently ponded, 0 to 1 percent slopes	22.11	B/D	2-10	Very Poor	Very Poor	Good	NR	Severe: ponding
42	Wabasso sand, limestone substratum, 0 to 2 percent slopes	262.36	B/D	2-5	Poor	Fair	Poor	NR	Severe: wetness, too sandy
43	Smyrna fine sand, 0 to 2 percent slopes	313.02	B/D	1-5	Fair	Fair	Fair	NR	Severe: wetness, too sandy
44	Malabar fine sand, frequently ponded, 0 to 1 percent slopes	6.26	B/D	1-2	Very Poor	Very Poor	Good	NR	Severe: ponding, too sandy

Soil Map Unit	Soil Name	Acres	Physical Attributes		Biological Attribute: Potential for Wildlife Use In				Limitations for Recreational Use*
			Hydrologic Group	% Organic Matter	Open Land	Wood land	Wetland	Rangeland	
45	Copeland fine sandy loam, frequently ponded, 0 to 1 percent slopes	35.07	D	2-6	Very Poor	Very Poor	Good	NR	Severe: ponding
48	St. Augustine sand, 0 to 2 percent slopes	11.41	C	1-3	Very Poor	Very Poor	Poor	NR	Severe: flooding, too sandy
49	Felda fine sand, frequently ponded, 0 to 1 percent slopes	21.21	D	1-4	Very Poor	Very Poor	Good	NR	Severe: ponding, too sandy
51	Floridana sand, frequently ponded, 0 to 2 percent slopes	4.27	D	6-15	Very Poor	Very Poor	Good	NR	Severe: ponding, percs slowly, too sandy
53	Myakka fine sand, frequently ponded, 0 to 1 percent slopes	31.40	D	1-2	Very Poor	Very Poor	Good	NR	Severe: ponding, too sandy
59	Urban land, 0 to 2 percent slopes	19.80	--	--	NR	NR	NR	NR	--
61	Orsino fine sand, 0 to 5 percent slopes	464.17	A	<1	Poor	Poor	Very Poor	NR	Severe: too sandy
63	Malabar fine sand, high, 0 to 2 percent slopes	80.29	B/D	1-2	Fair	Poor	Fair	Fair	Severe: wetness, too sandy
64	Hallandale fine sand, wet-Urban land complex, 0 to 2 percent slopes	32.16	B/D	2-5	Poor	Poor	Fair	Poor	Severe: wetness, too sandy
67	Smyrna fine sand-Urban land complex, 0 to 2 percent slopes	121.72	B/D	1-5	Fair	Fair	Fair	NR	Severe: wetness, too sandy
69	Matlacha gravelly fine sand, 0 to 2 percent slopes	15.46	C	--	NR	NR	NR	NR	Severe: too sandy
70	Heights fine sand, 0 to 2 percent slopes	6.81	B/D	1-2	Fair	Fair	Fair	NR	Severe: wetness, too sandy
73	Pineda fine sand, frequently ponded, 0 to 1 percent slopes	27.22	D	0.5-6	Very Poor	Very Poor	Good	NR	Severe: wetness, too sandy
76	Electra fine sand, 0 to 2 percent slopes	150.83	C	1-2	Poor	Poor	Poor	NR	Severe: too sandy
99	Water	101.30	--	--	NR	NR	NR	NR	--
100	Waters of the Gulf of Mexico	50.21	--	--	NR	NR	NR	NR	--
102	Boca fine sand-Urban land complex, 0 to 2 percent slopes	83.95	--	--	NR	NR	NR	NR	--
103	Boca fine sand, tidal-Urban land complex, 0 to 2 percent slopes	0.44	--	--	NR	NR	NR	NR	--
105	Copeland fine sandy loam, ponded-Urban land complex, 0 to 1 percent slopes	26.35	--	--	NR	NR	NR	NR	--
106	Daytona sand-Urban land complex, 0 to 5 percent slopes	4.31	--	--	NR	NR	NR	NR	--
107	EauGallie sand-Urban land complex, 0 to 2 percent slopes	39.83	--	--	NR	NR	NR	NR	--
108	Electra fine sand-Urban land complex, 0 to 2 percent slopes	4.82	--	--	NR	NR	NR	NR	--
109	Estero muck, tidal-Urban land complex, 0 to 1 percent slopes	3.85	--	--	NR	NR	NR	NR	--
110	Felda fine sand-Urban land complex, 0 to 2 percent slopes	9.51	--	--	NR	NR	NR	NR	--
111	Felda fine sand, ponded-Urban land complex, 0 to 1 percent slopes	21.29	--	--	NR	NR	NR	NR	--
112	Floridana sand, ponded-Urban land complex, 0 to 1 percent slopes	6.32	--	--	NR	NR	NR	NR	--
117	Isles fine sand, flooded-Urban land complex, 0 to 1 percent slopes	151.93	--	--	NR	NR	NR	NR	--
118	Kesson fine sand, tidal-Urban land complex, 0 to 1 percent slopes	3.91	--	--	NR	NR	NR	NR	--
119	Malabar fine sand-Urban land complex, 0 to 2 percent slopes	19.32	--	--	NR	NR	NR	NR	--
121	Malabar fine sand, high-Urban land complex, 0 to 2 percent slopes	4.23	--	--	NR	NR	NR	NR	--
123	Myakka fine sand-Urban land complex, 0 to 2 percent slopes	63.45	--	--	NR	NR	NR	NR	--

Soil Map Unit	Soil Name	Acres	Physical Attributes		Biological Attribute: Potential for Wildlife Use In				Limitations for Recreational Use*
			Hydrologic Group	% Organic Matter	Open Land	Wood land	Wetland	Rangeland	
124	Myakka fine sand, ponded-Urban land complex, 0 to 1 percent slopes	15.53	--	--	NR	NR	NR	NR	--
125	Oldsmar sand-Urban land, 0 to 2 percent slopes	120.11	--	--	NR	NR	NR	NR	--
126	Oldsmar fine sand, limestone substratum-Urban land complex, 0 to 2 percent slopes	21.72	--	--	NR	NR	NR	NR	--
127	Orsino fine sand-Urban land complex, 0 to 5 percent slopes	25.00	--	--	NR	NR	NR	NR	--
129	Pineda fine sand-Urban land complex, 0 to 2 percent slopes	43.44	--	--	NR	NR	NR	NR	--
132	Pompano fine sand, ponded-Urban land complex, 0 to 1 percent slopes	1.72	--	--	NR	NR	NR	NR	--
133	Punta fine sand-Urban land complex, 0 to 2 percent slopes	24.71	--	--	NR	NR	NR	NR	--
134	Satellite fine sand-Urban land complex, 0 to 2 percent slopes	18.05	--	--	NR	NR	NR	NR	--
135	St. Augustine sand-Urban land complex, 0 to 2 percent slopes	0.57	--	--	NR	NR	NR	NR	--
136	Valkaria fine sand-Urban land complex, 0 to 2 percent slopes	16.41	--	--	NR	NR	NR	NR	--
137	Wabasso sand-Urban land complex, 0 to 2 percent slopes	23.93	--	--	NR	NR	NR	NR	--
138	Wabasso sand, limestone substratum-Urban land complex, 0 to 2 percent slopes	175.24	--	--	NR	NR	NR	NR	--

* Assessment of recreational uses limited to camping and picnic areas, playgrounds, and paths/trials

NR – Not Reviewed

Hydrologic Soil Group: The runoff producing characteristics of the soil. Slope and plant cover are not considered.

Group B: When wet these soils have moderate infiltration rate. Soils have a moderate rate of water transmission.

Group C: When thoroughly wet these soils have a slow infiltration rate. Soils have a slow rate of water transmission.

Group D: When thoroughly wet these soils have a very slow infiltration rate and high runoff potential.

Potential for Wildlife Use:

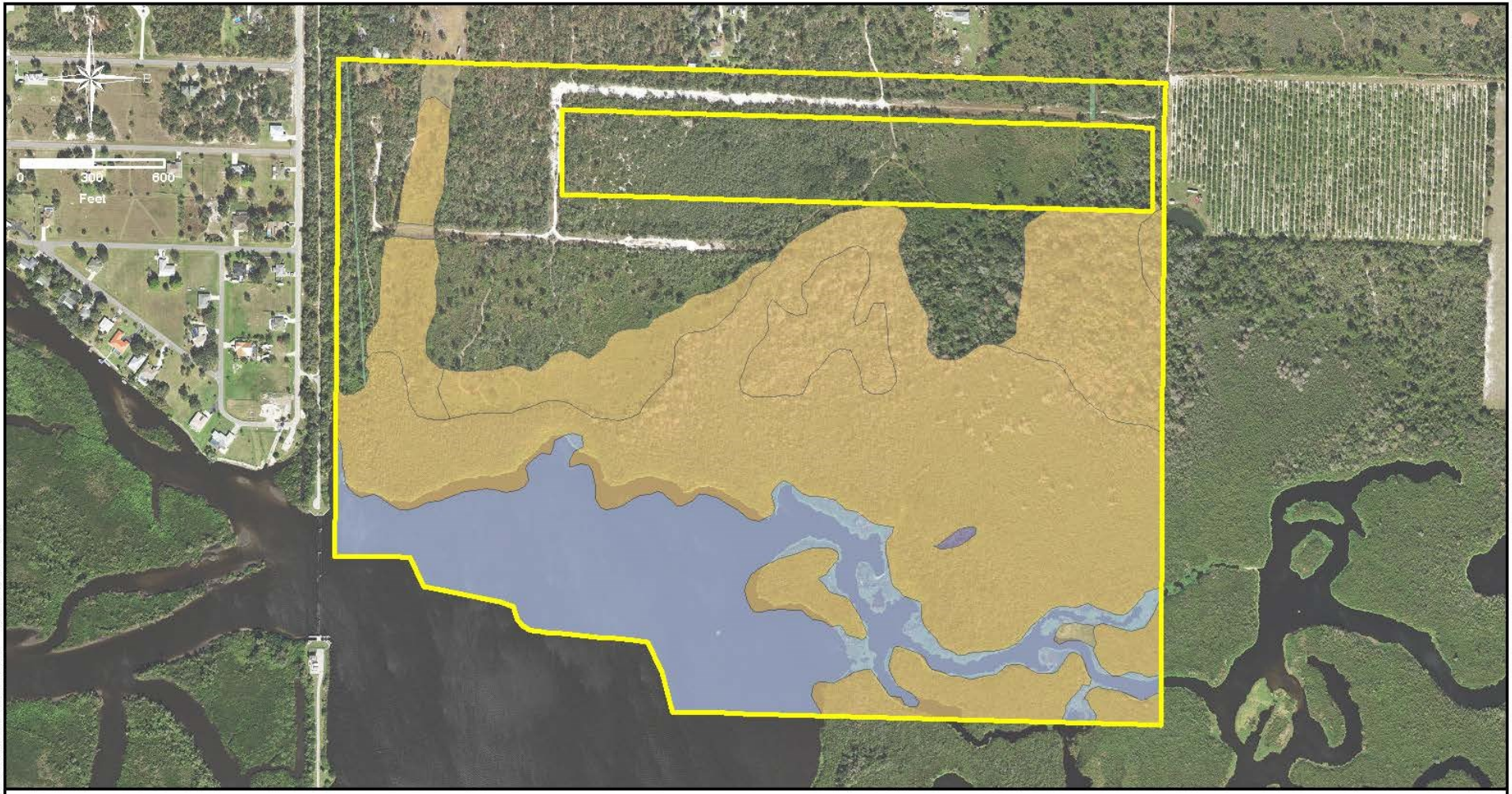
Good: Habitat is easily established, improved, or maintained.

Fair: Habitat can be established, improved, or maintained. Moderate to intensive management is required.

Poor: Limitations are severe; however, habitat can be created, improved, and/or maintained. Management is difficult and intensive.

Very Poor: Habitat restrictions are very severe and unsatisfactory results can be expected. Creating, improving. or maintaining habitat is impractical or impossible.

Appendix F:
Typical National Wetland Inventory Map



LEGEND

- Biscayne Conservation Easement

National Wetlands Inventory

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

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NOTES:

PARKS PER THE CHARLOTTE COUNTY GIS WEBSITE.

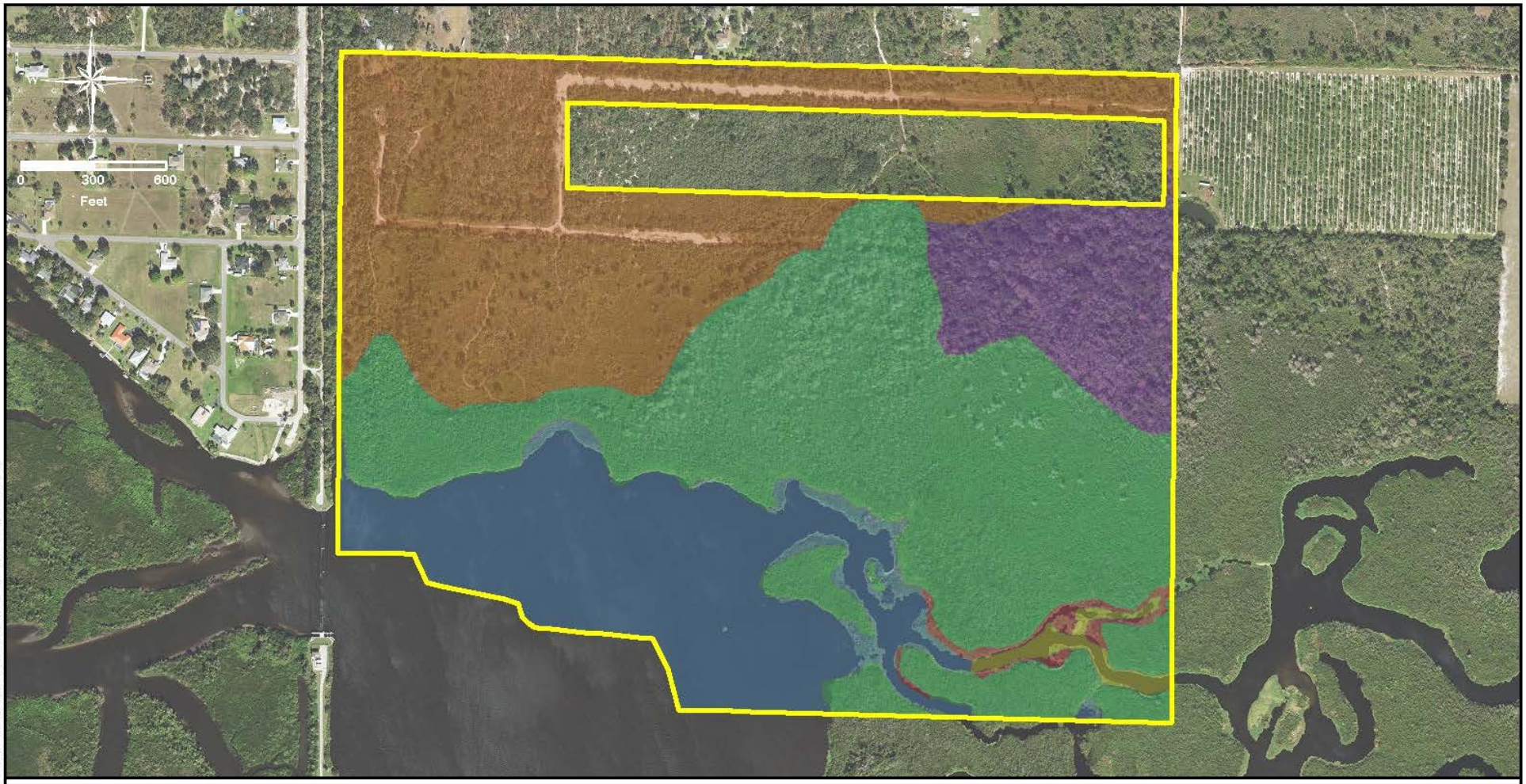
NATIONAL WETLANDS INVENTORY WAS ACQUIRED FROM THE USFWS WEBSITE AUGUST 2021.

APPENDIX E. TYPICAL NATIONAL WETLAND INVENTORY MAP
CHARLOTTE COUNTY BENEFIT OF PARKS

DRAWN BY	DATE
H.H.	12/20/21
REVIEWED BY	DATE
H.S.	12/20/21
REVISED	DATE

Consulting Ecologists
PASSARELLA & ASSOCIATES INC

Appendix G:
Typical SWFWMD FLUCFCS Map



LEGEND

- Biscayne Conservation Easement

SWFWMD FLUCFCS

- 1100, RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS PER ACRE
- 1900, OPEN LAND
- 2200, TREE CROPS
- 4340, UPLAND HARDWOOD - CONIFEROUS MIX
- 5100, STREAMS AND WATERWAYS
- 5200, LAKES
- 6410, FRESHWATER MARSHES
- 6440, EMERGENT AQUATIC VEGETATION

DRAFT

NOTES:

PARKS PER THE CHARLOTTE COUNTY GIS WEBSITE.

SWFWMD FLUCFCS WERE ACQUIRED FROM THE SWFWMD WEBSITE SEPTEMBER 2021 AND IS CURRENT TO 2017.

APPENDIX F. TYPICAL SWFWMD FLUCFCS MAP
CHARLOTTE COUNTY BENEFIT OF PARKS

DRAWN BY	DATE
H.H.	12/20/21
REVIEWED BY	DATE
H.S.	12/20/21
REVISED	DATE

PASSARELLA & ASSOCIATES INC
Consulting Ecologists

Appendix H:
Charlotte County Parks and Preserves
FLUCFCS Descriptions

Residential Low Density <2 Dwelling Units Per Acre (FLUCFCS Code 1100)

Areas of low intensity residential use. For the Charlotte County Parks and Natural Resources this land uses occurs where these lands abut residential neighborhoods. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing residential development.

Residential Medium Density 2 to 5 Dwelling Units Per Acre (FLUCFCS Code 1200)

Areas of medium intensity residential use. For the Charlotte County Parks and Natural Resources this land uses occurs where these lands abut residential neighborhoods. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing residential development.

Residential High Density (FLUCFCS Code 1300)

Areas of high intensity residential use. For the Charlotte County Parks and Natural Resources, this land uses occurs where these lands abut residential neighborhoods. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing residential development.

Commercial and Services (FLUCFCS Code 1400)

Commercial areas that are predominantly associated with the distribution of products and services. This can include a large number of individual types of commercial land uses which often in occur in complex mixtures. This land use category includes secondary structures associated with an enterprise in addition to the main building and integral areas assigned to support the base unit. Include are shed, warehouse, office buildings, driveways, parking lots and landscaped areas. For the Charlotte County Parks and Natural Resources, this land uses occurs where these lands abut commercial areas. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing commercial development.

Industrial (FLUCFCS Code 1500)

The industrial land use category includes uses where manufacturing, assembly or processing of materials and products are accomplishes. This can include a wide array of industry types. Also included are those facilities for administration and research, assembly, storage, warehousing, shipping, and associated parking lots and grounds. For the Charlotte County Parks and Natural Resources, this land uses occurs where these lands abut industrial areas. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing industrial development.

Institutional (FLUCFCS Code 1700)

Educational, religious, health and military facilities are typical components of this category. This includes all buildings, grounds, and parking lots that compose the facility. For the Charlotte County Parks and Natural Resources, this land uses occurs where these lands abut such facilities as described above. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing institutional development.

Recreational (FLUCFCS Code 1800)

The recreational land use category includes areas whose physical structure indicates that active user-oriented recreation is or could be occurring within a given physical area. This includes parks, swimming beaches, shores, marinas, fairgrounds, etc. While many of the parks could be included in this classification. The aerial interpretation of the SWFWMD FLUCFCS typically included parks with sports courts or fields and/or paved walking trails.

Golf Courses (FLUCFCS Code 1820)

The golf course land use category includes all greens and fairways, lakes and ponds, associated building structures, and parking lots. For Charlotte County Parks and Natural Resources, this land use designation reflects a mapping error where a small amount of land adjacent to Coral Creek Golf Course was designated over Charlotte County Parks and Natural Resources.

Open Land (FLUCFCS Code 1900)

This category includes undeveloped land within urban areas and inactive land with street patterns but without structures. Open land does not normally exhibit any structures or any indication of intended use. Often, this land use category may be in a transitional state and ultimately will be developed into one of the typical urban land uses although at the time of the inventory the intended use may be impossible to determine form an aerial photo alone. For Charlotte County these areas generally resemble FLUCFCS Code 3200 but contain signs of human disturbance such as tails and dirt roads.

Cropland and Pastureland (FLUCFCS Code 2100)

The Cropland and Pastureland category includes agricultural land that is managed for the production of row or field crops and improved, unimproved, and woodland pastures.

Tree Crops (FLUCFCS Code 2200)

The Tree Crops land use designation includes orchards and groves. Water bodies, that moderate the effects of short-term temperature fluctuations are often in close proximity to this type of agriculture.

Other Open Lands (FLUCFCS Code 2600)

This category includes agricultural lands whose intended usage cannot be determined. For Charlotte County Parks and Natural Resources, these areas are generally located next to adjacent cropland or pastureland.

Shrub and Brushland (FLUCFCS Code 3200)

This category includes saw palmettos, gallberry, wax myrtle, coastal scrub and other shrubs and brush. Generally, saw palmetto is the most prevalent plant cover intermixed with a wide variety of other woody scrub plant species as well as various types of short herbs and grasses. Coastal scrub vegetation would include pioneer herbs and shrubs composed of such typical plants as sea purslane, sea grapes and sea oats without any one of these types being dominant.

Mixed Rangeland (FLUCFCS Code 3300)

When more than one-third intermixture of either grassland or shrub-brushland range species occurs, the specific classification is changed to Mixed Rangeland. Where the intermixture is less than one-third, it is classified as the dominant type of rangeland, whether Grassland or Shrub and Brushland categories.

Pine Flatwoods (FLUCFCS Code 4110)

The pine flatwoods class is dominated by either slash pine, longleaf pine or both and less frequently pond pine. The common flatwoods understory species include saw palmetto, wax myrtle, gallberry and a wide variety of herbs and brush.

Upland Hardwood Forests-Part 1 (FLUCFCS Code 4200)

This classification of upland forest lands has a crown canopy with at least a 66 percent dominance by hardwood tree species.

Upland Hardwood-Conifer Mix (FLUCFCS Code 4340)

This class is reserved for those forested areas in which neither upland conifers nor hardwoods achieve a 66 percent crown canopy dominance.

Streams and Waterways (FLUCFCS Code 5100)

This category includes rivers, creeks, canals and other linear water bodies.

Lakes (FLUCFCS Code 5200)

The Lakes category includes extensive inland water bodies, excluding reservoirs. Islands within lakes that are too small to delineate will be included in the water area.

Reservoirs (FLUCFCS Code 5300)

Reservoirs are artificial impoundments of water. They are used for irrigation, flood control, municipal and rural water supplies, recreation and hydro-electric power generation.

Bays and Estuaries (FLUCFCS Code 5400)

Bays and estuaries are inlets or arms of the sea that extend into the land and, as such, are properly classified in this system only when they are included within the land mass of Florida. In order that this land mass be commensurate with the area the United States Government uses in compiling census statistics, the convention employed by the Bureau of Census in setting the outer limits of the United States has been followed. Where bays and estuaries are between one and ten nautical miles (1.85 and 18.5 kilometers) in width, the outer limit of the United States will be a straight line connecting the headlands except where the indentation of the embayment is so shallow that the water area would be less than the area of a semicircle drawn with this straight line as the diameter. In that event, the coastline itself would form the outer limit of the United States.

Gulf of Mexico (FLUCFCS Code 5720)

Open water areas associated with the Gulf of Mexico.

Wetland Hardwood Forests (FLUCFCS Code 6100)

Wetland Hardwood Forests are those wetland areas are 66 percent or more dominated by wetland hardwood species, either salt or freshwater.

Mangrove Swamps (FLUCFCS Code 6120)

This coastal hardwood community is composed of red and/or black mangrove which is pure or predominant. The major associates include white mangrove, buttonwood, cabbage palm and sea grape.

Stream and Lake Swamps [Bottomland] (FLUCFCS Code 6150)

This community, often referred to as bottomland or stream hardwoods, is usually found on but not restricted to river, creek, and lake flood plain or overflow areas. This category has a wide variety of predominantly hardwood species of which some of the more common components include red maple, river birch, water oak, sweetgum, willows, tupelos, water hickory, bays, and water ash and buttonbush. Associated species include cypress, slash pine, loblolly pine and spruce pine.

Wetland Coniferous Forests (FLUCFCS Code 6200)

Wetland Coniferous Forests are wetlands which are the result of natural generation. These communities are commonly found in the interior wetlands in such as places as river flood plains, bogs, bayheads and sloughs.

Wetland Forested Mixed (FLUCFCS Code 6300)

This category includes mixed wetlands forest communities in which neither hardwoods or conifers achieve a 66 percent dominance of the crown canopy composition.

Vegetated Non-Forested Wetlands (FLUCFCS Code 6400)

Vegetated Non-forested Wetlands include marshes and seasonably flooded basins and meadows. These communities are usually confined to relatively level, low-lying areas. This category does not include areas which have a tree cover which meets the crown closure threshold for the forested categories When the forest crown cover is less than the threshold for wetland forest or is non-woody, it will be included in this category. Sawgrass and cattail are the predominant species in freshwater marshes while spartina and needlerush are the predominant species in the saltwater marsh communities.

Freshwater Marshes (FLUCFCS Code 6410)

The communities included in this category are characterized by having one or more of the following species: sawgrass, cattail, arrowhead, maidencane, buttonbush, cordgrass, giant cutgrass, switchgrass, bulrush, needlerush, common reed, or arrowroot.

Saltwater Marshes (FLUCFCS Code 6420)

The communities included in this category will contain one or more of the following species: cordgrasses, needlerush, seashore saltgrass, saltwort, glassworts, fringerush, salt dropseed, seaside daisy, salt jointgrass.

Wet Prairies (FLUCFCS Code 6430)

This classification is composed predominately of grassy vegetation on hydric soils and is usually distinguished from marshes by having less water and shorter herbage.

Emergent Aquatic Vegetation (FLUCFCS Code 6440)

This category of wetland plant species includes both floating vegetation and vegetation which is found either partially or completely above the surface of water.

Intermittent Ponds (FLUCFCS Code 6530)

This category of wetland is defined as a waterbody which exists for only a portion of the year. It may be referred to as a seasonal waterbody. Its existence relies upon water received directly from precipitation, runoff or spring flow.

Salt Flats (FLUCFCS Code 6600)

This category is composed of that portion of the shore environment protected from wave action, as in the case of estuaries, comprised primarily of muds transported by tidal channels. An important characteristic of the salt flat environment is its alternating tidal cycle of submergence and exposure to the atmosphere.

Disturbed (FLUCFCS Code 7400)

Disturbed Lands are those areas which have been changed due primarily to human activities other than mining. In Florida, these areas may be rather extensive and often appear outside of urban areas.

Transportation (FLUCFCS Code 8100)

Transportation facilities are used for the movement of people and goods; therefore, they are major influences on land and many land use boundaries are outlined by them.

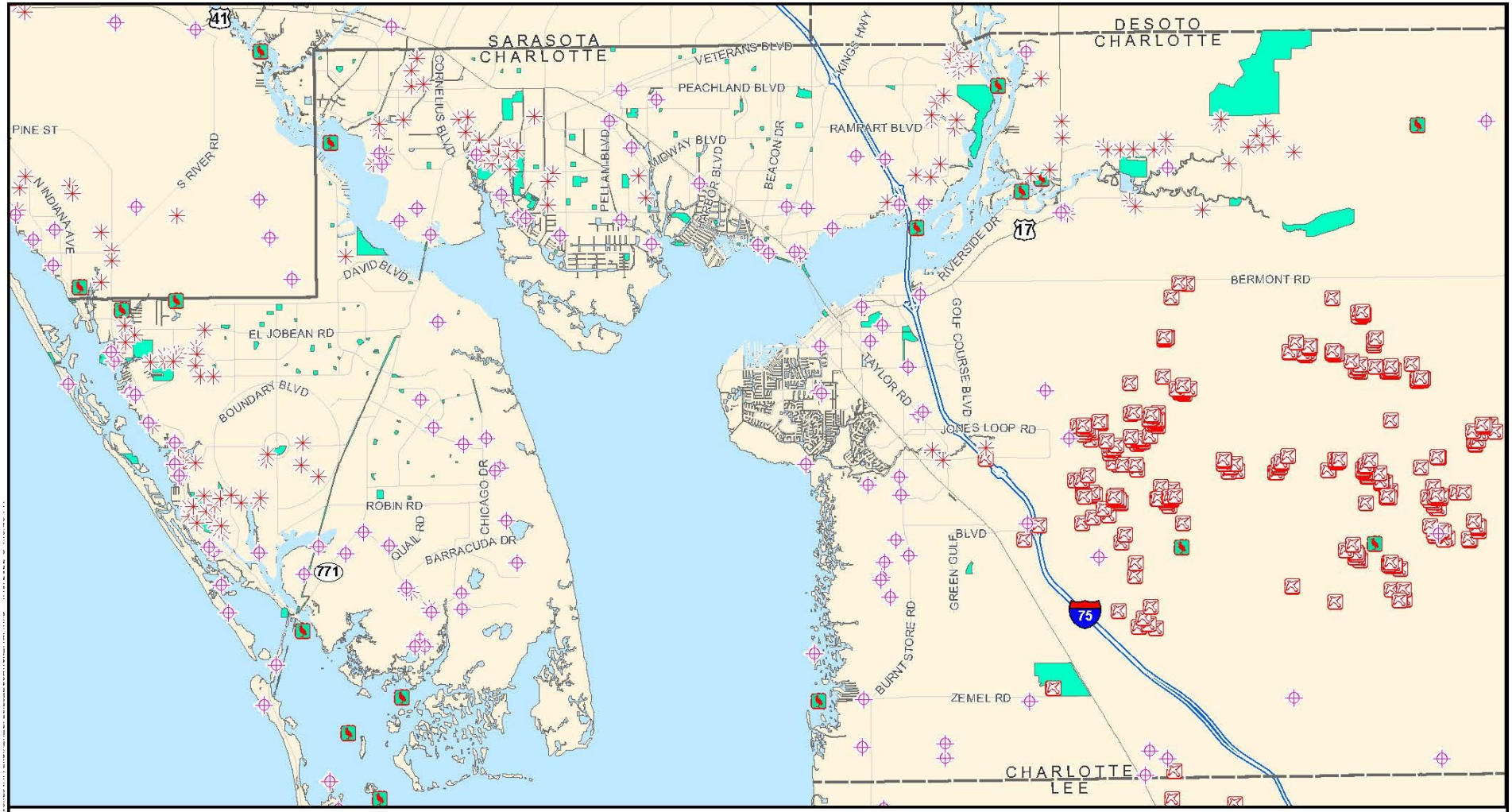
The Transportation category encompasses rail-oriented facilities including stations, round-houses, repair and switching yards and related areas. Airport facilities include runways, intervening land, terminals, service buildings, navigational aids, fuel storage, parking lots and a limited buffer zone and fall within the Transportation category.

Transportation areas also embrace ports, docks, shipyards, dry docks, locks and water course control structures designed for transportation purposes. The docks and ports include buildings, piers, parking lots and adjacent water utilized by ships in the loading and unloading of cargo or passengers. Locks, in addition to the actual structures, include the control buildings, power supply buildings, docks and surrounding supporting land use (i.e., parking lots and green areas). For the Charlotte County Parks and Natural Resources, this land uses occurs where these lands abut transportation features. This classification is a product of aerial imagery interpretation done at a large scale, rather than these lands containing transportation related development.

Utilities (FLUCFCS Code 8300)

Utilities usually include power generating facilities and water treatment plants including their related facilities such as transmission lines for electric generation plants and aeration fields for sewage treatment sites. Small facilities or those associated with an industrial, commercial, or extractive land use are included within these larger respective categories.

Appendix I:
Documented Occurrences of Listed Species



LEGEND

- Charlotte County Parks and Preserves
- Bald Eagle Nest Location
- Red-Cockaded Woodpecker Location
- Scrub Jay Location
- Wading Bird Location

N
W E
S

0 3.5 7
Miles

DRAFT

NOTES:

EAGLE NEST LOCATIONS WERE ACQUIRED FROM THE AUDUBON EAGLEWATCH ON SEPTEMBER 2021 AND ARE CURRENT TO END OF 2021 NESTING SEASON.

RED-COCKADED WOODPECKER LOCATIONS WERE ACQUIRED FROM THE FWCC ON SEPTEMBER 2021.

SCRUB JAY LOCATIONS WERE ACQUIRED FROM THE USFWS ON SEPTEMBER 2021.

WADING BIRD ROOKERIES WERE ACQUIRED FROM THE FWCC ON SEPTEMBER 2021 AND ARE CURRENT TO 1999.

APPENDIX H. DOCUMENTED OCCURRENCES OF LISTED SPECIES
CHARLOTTE COUNTY BENEFIT OF PARKS

DRAWN BY	DATE
H.H.	12/21/21
REVIEWED BY	DATE
H.S.	12/21/21
REVISED	DATE

Passarella & Associates, Inc. Consulting Ecologists

Appendix J:
Florida Recreation & Parks Impact Report

FLORIDA RECREATION & PARKS IMPACT REPORT

WEILER ENGINEERING CORPORATION

FRPA FLORIDA RECREATION & PARK ASSOCIATION

POWERED BY SPORTS FACILITIES ADVISORY

Date Report Generated: 01/14/2022

FRPA FLORIDA RECREATION & PARK ASSOCIATION

WHY REPORTS MATTER.

As Albert Einstein once said, "Not everything that counts can be counted, and not everything that can be counted counts." Meaningful and accurate data-driven reporting is one of the most important ways to communicate value. Common reporting methodologies focus on data that is easily collected, but has little correlation to the larger, more substantial community impact that, in reality, a park ignites. If reports are difficult to assimilate, then they have less chance of actually being created. If there is no connection to a broader community context, then there is less relevance.

If stakeholders and decision makers fail to see the value in parks then, arguably, there is no value. Demonstrating how parks add value should be a fundamental focus for agencies looking to develop, maintain, and grow community assets.

What if you could generate specific, accurate, evidence-based reports, capable of communicating the value of a single park or your entire park system in terms of dollars and areas of significant impact? FRPA's new Impact Calculator website will help you to do exactly that. Developing a customized report that will help to transcend the noise of meaningless data to provide a relevant, usable and meaningful report that will effectively influence and support decision makers in a way that justifies the continued allocation of resources and value of your park system through a report that matters, because parks matter.

Felicia d. Donnelly

Felicia Donnelly
2018-2019 President

FRPA FLORIDA RECREATION & PARK ASSOCIATION

THE POWER OF PARKS.

We can all name a positive feeling we get when we are outdoors in a park or watching a child's first dance class at the local recreation center. The mental and physical benefits of parks and recreation are a little easier to define. Concerts…Baseball Games… Festivals… Tournaments… these are just a few ways that park and recreation departments add to the economic benefits of a community. The impact of these events, along with the value of having a community center or park near a neighborhood, can shape a community's economic standing and quality of life.

According to a study by the National Recreation and Park Association, in conjunction with the Center for Regional Analysis at George Mason University, in 2013 Florida's local and regional public park agencies generated nearly $7.2 billion in economic activity and supported over 60,000 jobs in the state. The Economic Impact Pillar of the FRPA Strategic Plan hopes to leverage the economic impact of park and recreation agencies to ultimately improve funding sources that allow departments to serve their community in the highest capacity.

By partnering with Sports Facilities Advisory on the development of a statewide impact calculator, FRPA is now able to provide members with a platform for educating and influencing internal and external audiences about the quantifiable impact and value of parks.

This initiative will build a network of advocates positioned to promote the message of how important parks and recreation offerings are to a community and provide agencies with the resources to help establish best practices and build sustainable and expanded funding models that validate the power of parks.

Eleanor J. Warmack

Eleanor Warmack
Executive Director

WEILER ENGINEERING CORPORATION

INCREMENTAL PROPERY VALUES BASED ON THE PROXIMITY EFFECT.

Distance from parks and trails is known to influence property values. Nationwide research shows that the premium for proximity to these spaces can affect market values up to 2,000 feet by 20 percent or more. Parks and recreation areas can also lead to proportionately higher property tax revenues for local governments.

The real estate market consistently demonstrates that people are willing to pay more for a house close to a park, which results in higher home values.*

$7,590

IN INCREMENTAL PROPERTY VALUES

$2

IN INCREMENTAL TAX REVENUE

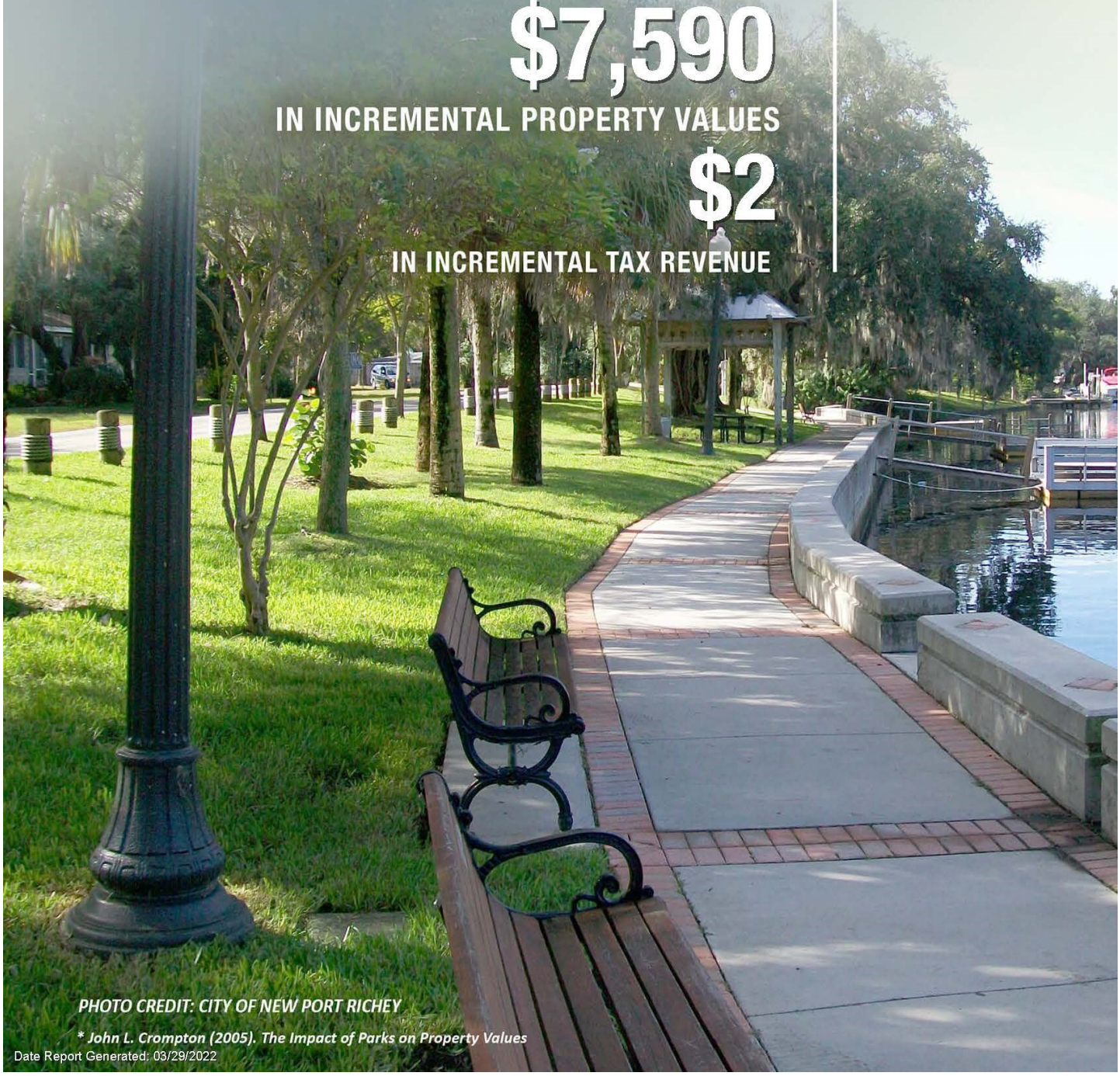


PHOTO CREDIT: CITY OF NEW PORT RICHEY

** John L. Crompton (2005). The Impact of Parks on Property Values*

Date Report Generated: 03/29/2022

WEILER ENGINEERING CORPORATION

HEALTH CARE SAVINGS ATTRIBUTED TO ACCESS TO PARKS.

Studies of health care economics and policy have established that increased access to public outdoor spaces and more biking and walking infrastructure encourages people to exercise, which as a result, reduces overall health care expenditures.

Strong evidence shows that when people have access to parks, they are more likely to exercise, which can reduce healthcare costs.*

$760.7 MILLION

IN ANNUAL HEALTH CARE COST SAVINGS

PHOTO CREDIT: PALM BEACH COUNTY

** The Trust for Public Land.(2006) - The Health Benefits of Parks*

Date Report Generated: 01/14/2022

WEILER ENGINEERING CORPORATION

IMPACT ON THE ENVIRONMENT BASED ON STORM WATER MANAGEMENT.

Parks have been proven to positively impact the environment and reduce the cost of storm water management, pollution mitigation, energy consumption, and other environmental-related issues.

$3.9 MILLION

SAVINGS IN STORMWATER MANAGEMENT COSTS

Parks serve to mitigate climate changes that are a result of urban heat island effects, such as modified temperature, wind, rain, and air quality patterns.*

PHOTO CREDIT: CITY OF CAPE CORAL

** American Planning Association (2007) - Climate Change Management*

Date Report Generated: 01/14/2022

THE AMOUNT OF TOURISM DOLLARS GENERATED.

From majestic parks to oceanside beaches and sports tourism destinations, visitors are attracted to Florida's natural resources and spend money on food, travel, and lodging during their stay, bringing new dollars and tax receipts into the region.

$42 MILLION

ANNUAL SPENDING GENERATED THROUGH RECREATION AND/OR EVENTS

The estimated direct economic impact of Florida state parks is $3 billion, generating $205 million in increased sales tax revenue.*

PHOTO CREDIT: LEE COUNTY

** Florida Department of Environmental Protecti) - Economic Impact Assessment - Florida State Park System*

Date Report Generated: 01/14/2022

WEILER ENGINEERING CORPORATION

PUBLIC SAFETY THROUGH PARKS AND RECREATION PROGRAMS.

Parks that offer spaces that are well-maintained, and activated can have a positive impact on the public safety of the communities they are located in. Additionally, parks that offer out-of-school time programming (before school activity, after school activity, summer camps, volunteer opportunities, etc.) can help deter youth from engaging in risky behavior.

356 YOUTH

IN OUT-OF-SCHOOL PROGRAMMING

210 YOUTH

IN SWIM LESSONS AND WATER SAFETY PROGRAMS

Data suggests that kids who are enrolled in Out-of-School Time Programs are more likely to have higher self-esteem, greater academic achievement, and lower instances of delinquency than those who do not participate.*

PHOTO CREDIT: LEE COUNTY

** National Recreation & Park Association (NRPA) - Out of School Time Report (2018)*

Date Report Generated: 01/14/2022

WEILER ENGINEERING CORPORATION

TOTAL JOBS SUPPORTED BY PARKS & RECREATION PROGRAMS.

Parks have been proven to be drivers of significant economic activity, having a positive impact on the economy through supporting jobs in local communities. The calculator strives to utilize currently published data to quantify the total jobs supported.

Florida had an impact of: $7.2 billion in economic activity, and $2.5 billion in labor income, supported by more than 60,100 jobs

94 JOBS
IN RELATED EMPLOYMENT

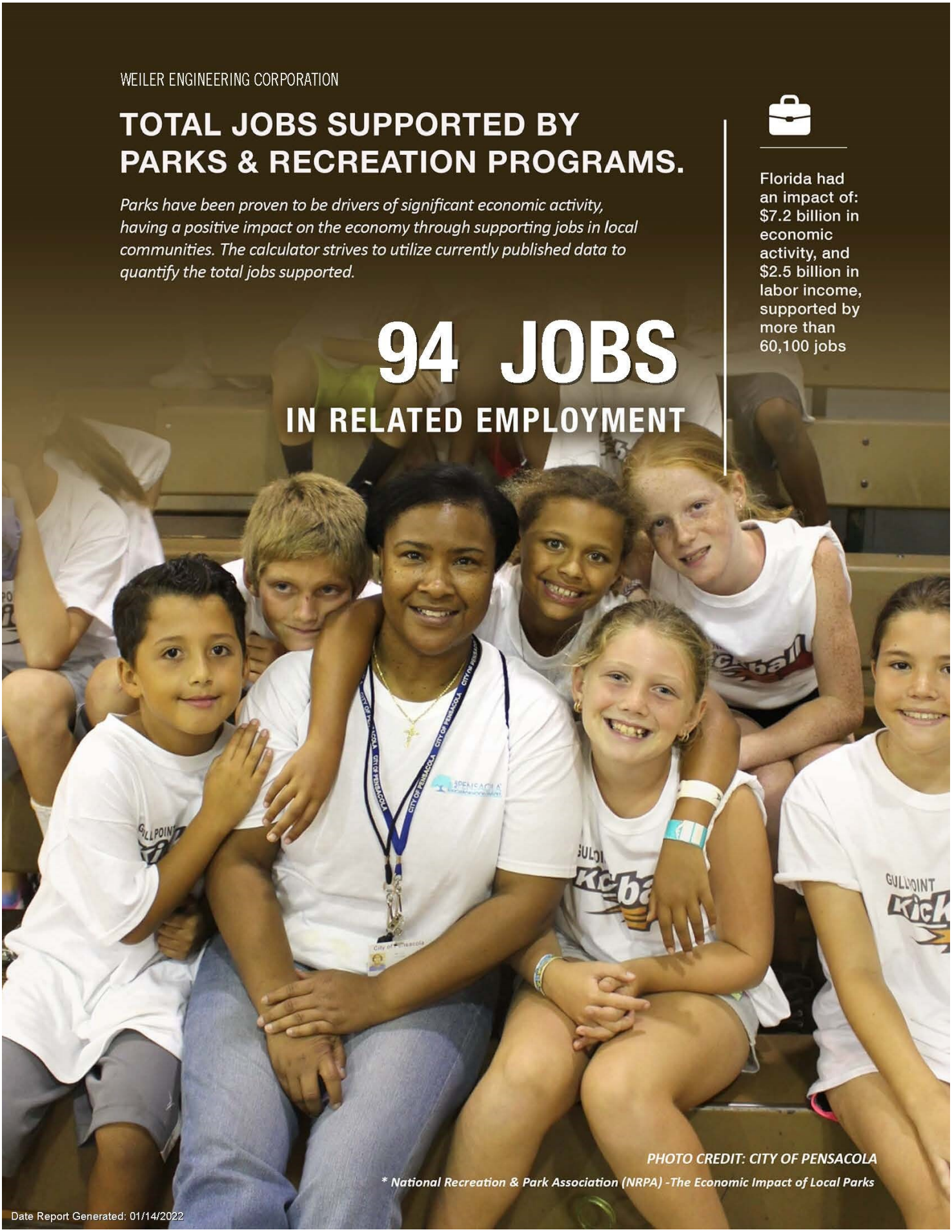


PHOTO CREDIT: CITY OF PENSACOLA

** National Recreation & Park Association (NRPA) -The Economic Impact of Local Parks*

Date Report Generated: 01/14/2022

FRPA FLORIDA RECREATION & PARK ASSOCIATION

SUMMARY REPORT

WEILER ENGINEERING CORPORATION

Overview:

The following is the estimated impact of the park system or park based on increases in home values and incremental taxes, healthcare cost savings, annual direct spending, environmental savings, job creation and the value of public safety.

$882,808
IN INCREMENTAL PROPERTY VALUES

$883
IN INCREMENTAL TAX REVENUE

$760.7 MILLION
IN ANNUAL HEALTH CARE COST SAVINGS

$42 MILLION
IN ANNUAL DIRECT SPENDING

$3.9 MILLION
IN ENVIRONMENTAL SAVINGS

94 JOBS
IN RELATED EMPLOYMENT

356 YOUTH
IN OUT-OF-SCHOOL PROGRAMMING

210 YOUTH
IN SWIM LESSONS/WATER SAFETY PROGRAMS



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Date Report Generated: 01/14/2022

FRPA TEAM MEMBERS

Eric Call

Director, Palm Beach County Parks and Recreation

Eric M. Call is the Director of the Palm Beach County Parks and Recreation Department where for more than 35 years he has been a recognized leader in the parks and recreation industry. He currently oversees an award-winning 103 parks, 1,075 employees and a $77 million annual operating budget – the 11th largest park system in the nation.

For more information visit: https://calculator.frpa.org/about/

Felicia Donnelly

Assistant City Manager/Economic Development Director, City of Oldsmar

Felicia Donnelly, AICP has spent 28 years helping communities achieve their vision in both the private and public sectors in the areas of government operations, parks and recreation, community engagement, land use planning and transportation.

For more information visit: https://calculator.frpa.org/about/

Dr. Janet E. Fulton

Chief, Physical Activity and Health Branch, Centers for Disease Control and Prevention

Dr. Janet E. Fulton is an epidemiologist and Chief of the Physical Activity and Health Branch in the Division of Nutrition, Physical Activity, and Obesity at the Centers for Disease Control and Prevention in Atlanta, Georgia. She earned her PhD in Epidemiology from the University of Texas-Houston, School of Public Health.

For more information visit: https://calculator.frpa.org/about/

T. Michael Starves

Assistant City Manager, City of Winter Haven

T. Michael Stavres has over 30 years in local government experience associated with parks and recreation and municipal administration. He has worked with the Cities of Lakeland, Temple Terrace, St. Petersburg, and Orange County. He has spent the past 17 years with the City of Winter Haven serving as Parks & Recreation Director, Community Services Director, since 2016 as the Assistant City Manager.

For more information visit: https://calculator.frpa.org/about/

Dr. Tom Tomerlin

Dr. Tom Tomerlin served as the Assistant City Manager for the City of Lake Mary, Florida. He was responsible for guiding and implementing the City's economic development strategy, as well as directing various functions for the City. Dr. Tomerlin is a seasoned economist with over 20 years of experience in the analysis of both public and private sector issues.

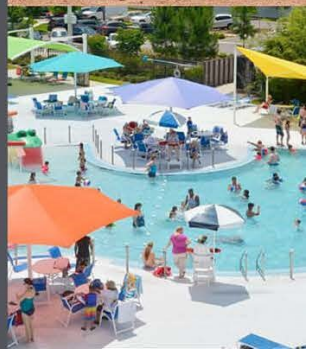
For more information visit: https://calculator.frpa.org/about/

Bryan Nipe

Director, Lake Mary Parks and Recreation

Bryan Nipe has 15 years of experience in a management role, 10 of which are in the parks and recreation field. Bryan is currently the Parks and Recreation Director for the City of Lake Mary where he and his team oversee city facilities, building maintenance, beautification, events, recreation programs and the renowned Lake Mary Events Center.

For more information visit: https://calculator.frpa.org/about/



Date Report Generated: 01/14/2022

SFA TEAM MEMBERS

Dev Pathik

Founder and CEO, Sports Facilities Advisory

Dev Pathik founded Sports Facilities Advisory in 2003 and is widely regarded as an industry thought-leader who has contributed to the well-being of communities around the world.

For more information visit: https://calculator.frpa.org/about/

Evan Eleff

CCO, Sports Facilities Advisory

Evan serves as COO of SFA overseeing the company's customer service and delivery systems as well as the team of strategic advisors, business analysts, project managers, and research specialists who produce SFA's market research, feasibility, and financing services.

For more information visit: https://calculator.frpa.org/about/

Daniel Morton

Strategic Advisor, Sports Facilities Advisory

Dan joined SFA in 2012 as a market research and document specialist, and today serves as a Strategic Advisor, leading SFA's team of market specialists and business analysts through the development of market studies, financial forecasts, economic impact analyses, feasibility studies, and existing facility optimization plans.

For more information visit: https://calculator.frpa.org/about/

Gary Smallshaw

Strategic Advisor, Sports Facilities Advisory

Gary currently helps to lead Sports Facilities Advisory's team of business analysts and researchers in assessing market opportunities, producing feasibility studies and delivering institutional-grade financial pro formas.

For more information visit: https://calculator.frpa.org/about/

Jared Carnes

Project Manager, Sports Facilities Advisory

Since joining Sports Facilities Advisory, Jared has worked on a portfolio of over 80 projects totaling more than $200 million in planned and operational recreation, wellness, sports tourism, and entertainment destinations.

For more information visit: https://calculator.frpa.org/about/

Richard Stiftinger

Project Coordinator, Sports Facilities Advisory

Prior to joining Sports Facilities Advisory, Richard has previously worked for the Tampa Bay Rays, Seminole Hard Rock Hotel & Casino Tampa, and JPMorgan Chase & Co. Richard earned a bachelor's degree in Psychology from the University of South Florida.

For more information visit: https://calculator.frpa.org/about/

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THE FLORIDA RECREATION AND PARK ASSOCIATION

The Florida Recreation and Park Association is a non-profit organization dedicated to the promotion, preservation, and advocacy of the Parks, Recreation and Leisure Services profession. Originally organized in 1942 and incorporated in 1983, the Association is directed by a volunteer Board of Directors, and an Executive Office based in Tallahassee.

The mission of the Florida Recreation and Park Association is to establish parks and recreation as a cornerstone of health, economic development, environmental sustainability, and community throughout the State of Florida.

Our vision is an empowered and engaged network of members, advocates, and partners equipped to advance parks and recreation.Through a vast network of recreation and park professionals and advocates, FRPA forwards the message of the importance parks and recreation in the areas of health, environmental resiliency and sustainability, community building, and economic impact.

THE FLORIDA RECREATION AND PARK ASSOCIATION FOUNDATION

The Florida Recreation and Park Association Foundation is committed to supporting the professional development and education of leisure professionals, students and citizen advocates. The FRPA Foundation was established in 1998 to support the development and education of parks and recreation professionals, students, and citizen advocates in the State of Florida. In conjunction with The Florida Recreation and Park Association, our intent is to educate, advocate, and communicate the benefits of parks and recreation by investing in our individual professionals working in the industry. The Board of Trustees has adopted a strategic plan in support of the priorities facing the parks and recreation profession and professionals in Florida.

SPORTS FACILITIES ADVISORY

The mission of Sports Facilities Advisory is to dramatically improve the health and economic vitality of the communities we serve.

Our goal is to transform the decision making process for parks & recreation budgets, empowering parks professionals and advocates with data that elevates the conversation around the true value of parks. We believe that parks are a vital ingredient in a recipe for building a healthier society — providing opportunities for increased physical activity, access to sport and a community hub for social engagement.

Date Report Generated: 01/14/2022

PROPERTY VALUES CALCULATIONS & CITATIONS

The studies essentially used John L. Crompton's research on the Proximate Principle. The calculation involves estimating the market value of homes within 500 feet of a park and then using a very conservative multiplier to estimate the incremental value attributable to park proximity. The local tax rate was applied to the market value to estimate the incremental tax benefit as well.

Resources/Articles: Property Values:

The Economic Benefits of the Park and Recreation System of Mecklenburg County, North Carolina – The Trust for Public Land (2010)
http://cloud.tpl.org/pubs/ccpe_MecklenburgNC_econben.pdf

The Economic Benefits of Cleveland Metroparks – Trust for Public Land (2018)
https://www.tpl.org/clevelandeconbenefits#sm.0000hrqebqa2he59x3x2fxbguuwkv

John Crompton's work:
https://rpts.tamu.edu/the-proximate-principle-impact-of-parks-on-property-value/

HEALTH SAVINGS CALCULATIONS & CITATIONS

Based on previous work in health care economics (including a National Medical Expenditures Survey that has been widely cited), this calculator assigns a value of $1,230 as the annual medical cost savings of adults under 65 years old, who exercise regularly (according to the CDC guidelines for levels for moderate and/or vigorous physical activity levels). The assigned value of $1,230 was doubled to $2,460 for adults over 65, because seniors typically incur 2-3 times the average healthcare expenditures of working-age people.

Resources/Articles: Health Savings:

The Economic Benefits of the Park and Recreation System of Mecklenburg County, North Carolina – The Trust for Public Land (2010)
http://cloud.tpl.org/pubs/ccpe_MecklenburgNC_econben.pdf

The Economic Benefits of Cleveland Metroparks – Trust for Public Land (2018)
https://www.tpl.org/clevelandeconbenefits#sm.0000hrqebqa2he59x3x2fxbguuwkv

M. Pratt, C. A. Macera, and G. Wang, "Higher Direct 103 Medical Costs Associated with Physical Inactivity," Physician and Sports Medicine 28, no. 10 (2000): 63–70.
https://www.tandfonline.com/doi/abs/10.3810/psm.2000.10.1237

PUBLIC SAFETY CALCULATIONS & CITATIONS

Parks that offer spaces that are well-maintained, and activated can have a positive impact on the public safety of the communities they are located in. Additionally, Parks that offer out-of-school time programming can help deter youth from engaging in risky behavior. Furthermore, Parks and Recreation is the leading provider of low-cost/free aquatics programming. These programs can help to lower drowning cases, which is one of leading causes of death for children ages one through four.

Resources

- https://www.nrpa.org/parks-recreation-magazine/2015/september/structured-recreation-programming-can-help-reduce-juvenile-crime/
- http://www.nccu.edu/formsdocs/proxy.cfm?file_id=2907
- https://www.cdc.gov/homeandrecreationalsafety/water-safety/waterinjuries-factsheet.html
- https://www.nrpa.org/parks-recreation-magazine/2019/february/park-pulse-the-importance-of-learning-to-swim-at-a-young-age/

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ENIVIRONMENTAL IMPACT CALCULATIONS & CITATIONS

Parks have been proven to positively impact the environment and reduce the cost of environmental impacts for communities related to storm water management, pollution mitigation, energy consumption, and other issues. The calculator strives to utilize currently published data to quantify the positive environmental impacts in terms of the appropriate unit measurement (I.e. Gallons of storm water mitigated) and the monetary value of these impacts. The two calculations consider the impacts in terms of number of trees as well as the number of acres of parkland.

Resources/Articles

Urban Forestry Tree Guide: Florida Regions – US Forest Service (2006–2010)
https://www.fs.fed.us/psw/topics/urban_forestry/products/tree_guides.shtml

STRATUM Climate Zones Map
https://www.fs.fed.us/psw/topics/urban_forestry/images/ncz_map.jpg

Central Florida Community Tree Guide: Benefits, Costs, and Strategic Planting
https://www.fs.fed.us/psw/topics/urban_forestry/products/2/psw_cufr797_psw_gtr230.pdf

Coastal Plain Community Tree Guide: Benefits, Costs, and Strategic Planting
https://www.fs.fed.us/psw/topics/urban_forestry/products/2/cufr_679_gtr201_coastal_tree_guide.pdf

Tropical Community Tree Guide: Benefits, Costs, and Strategic Planting
https://www.fs.fed.us/psw/topics/urban_forestry/products/2/psw_cufr753_psw_gtr216.pdf

The Economic Benefits of the Park and Recreation System of Mecklenburg County, North Caroline – The Trust for Public Land (2010
http://cloud.tpl.org/pubs/ccpe_MecklenburgNC_econben.pdf

The Economic Benefits of Cleveland Metroparks – Trust for Public Land (2018)
https://www.tpl.org/clevelandeconbenefits#sm.0000hrqebqa2he59x3x2fxbguuwkv

TOURISM IMPACT CALCULATIONS & CITATIONS

Event/Visitor Tourism articles:

- Florida Department of Environmental Protection – Economic Impact Assessment for the Florida State Park System
- Florida Sports Foundation – The Economic Impact of the Florida Sports Industry
- Florida Department of Environmental Protection – Economic Impact of Outdoor Recreation Activities in Florida
- Oxford Economics – The Economic Impact of Out-of-State Visitors in Florida
- National Park Service, U.S. Department of the Interior – National Park Spending Effects
- The American Planning Association – How Cities Use Parks to Promote Tourism
- Outdoor Industry Association – The Outdoor Recreation Economy
- Americans for the Arts – Arts & Economic Prosperity 5 – The Economic Impact of Nonprofit Arts & Cultural Organizations & Their Audiences
- Journal of Park and Recreation Administration – The Impact of 30 Sports Tournaments, Festivals, and Spectator Events in Seven U.S. Cities

JOBS IMPACT CALCULATIONS & CITATIONS

Parks have been proven to be drivers of significant economic activity, having a positive impact on the economy through supporting jobs in local communities. The calculator strives to utilize currently published data to quantify the total jobs supported.

Resources

https://www.nrpa.org/siteassets/research/economic-impact-study-summary-2018.pdf
https://floridadep.gov/sites/default/files/Economic%20Impact%20Assessment%202016-2017.pdf

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FRPA
FLORIDA RECREATION
& PARK ASSOCIATION

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www.frpa.org

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Abogawat. (2008, June 5). Clouds sky atmosphere blue - free photo on Pixabay. Retrieved October 6, 2021, from https://pixabay.com/photos/clouds-sky-atmosphere-blue-sky-49520/.

Accessible trails kayak launches - Charlotte County, Florida. (n.d.). Retrieved September 28, 2021, from https://www.charlottecountyfl.gov/core/fileparse.php/920/urlt/accessible-trails-kayak-launches.pdf.

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