~~INTRODUCTION~~

~~The Town of Palm Beach lies entirely within the coastal zone. Consequently, this Element incorporates the Coastal Management and Conservation Elements into one comprehensive inventory, and analysis of the Town's coastal and natural resources.~~

~~The purposes of this Element are to plan for and, where appropriate, restrict development activities where such activities would damage or destroy coastal resources; to protect human life; to limit public expenditures in areas subject to destruction by natural disaster; and to promote the conservation, use, and protection of natural resources.~~

~~This Element of the Plan has been updated based upon:~~

1. ~~Analysis of existing land uses in the coastal area as of April 2016; conflicts among shoreline uses; need for water-dependent and water-related uses; areas in need of redevelopment; and, the economic base of the coastal area;~~

2. ~~Analysis of the effect of future land uses on natural resources;~~

3. ~~Analysis of the impacts of development on historic resources and sites;~~

4. ~~Analysis of estuarine pollution conditions;~~

5. ~~Analysis of natural disaster planning concerns;~~

6. ~~Analysis of beach and dune conditions;~~

7. ~~Analysis of public access facilities;~~

8. ~~Analysis of existing infrastructure;~~

9. ~~Analysis of pertinent natural resources in the community;~~

10. ~~Analysis of existing commercial, recreational, and conservation uses of these natural resources; potential for their conservation, use, or protection; and, known pollution problems;~~

11. ~~Analysis of current and projected water needs and sources.~~

EXECUTIVE SUMMARY

The history of Florida's land conservation movement rose from the realization that as Florida's population continues to grow, increasing demands would be placed on the State's natural resources. For over 50 years the State of Florida has continued to execute substantial land acquisition programs to save native landscape from development, including the following. 1

- ✓ **1968: Established a $20 million bond program to acquire outdoor recreation lands.**
- ✓ **1972: Allocated an additional $40 million for an outdoor recreation bond and established a $200 million Environmentally Endangered Lands (EEL) program.**
- ✓ **1979: Established the Conservation and Recreation Lands (CARL) program.**
- ✓ **1981: Developed Save Our Coast (SOC) and Save Our Rivers (SOR) programs.**
- ✓ **1990: Established the Florida Preservation 2000 (P2000) program.**
- ✓ **2000: Started the Florida Forever program.**

Pursuant to §163.3177(6)a Fla. Stat., a Conservation Element is required for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, waterwells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources, including factors that affect energy conservation.

The Town of Palm Beach implements the policies of the Conservation Element through the enforcement of the regulations pertaining to conservation and protection of natural resources and wildlife found in Chapter 66. Additionally, the Town instituted several conservation policies to prevent habitat loss through the provision of ecofriendly alternatives, referred to as the Town's "Green Initiative" also provided within Chapter 66. The Conservation Element provides an inventory of ecological communities that were inventoried in 1996. As almost 30 years have passed, the Town should consider updating the inventory and continue to monitor it in order to ensure the continued success of the Town's natural resources and wildlife.

~~While all of the comprehensive plan elements required by F.S. 163 have been inventoried and analyzed, the built-out landscape of Palm Beach limits concern to but a few specific issues and problems. These are chiefly associated with natural resource protection.~~

~~HAZARDOUS WASTES~~

~~The Town will continue to protect its soils and groundwater through existing prohibitions on industry, standard operating procedures, and intergovernmental coordination with appropriate agencies.~~

1

~~DRAINAGE~~

~~The natural drainage patterns of the Town have been altered by urban development. Stormwater is either held in retention areas or routed to Lake Worth. In 1986, all new construction and major renovations have been required to retain the first inch of rainfall per the Town's code in conformance with requirements of the South Florida Water Management District. However, this requirement was increased to two inches in 1992. More detailed inventory and analysis of drainage and related infrastructure are contained in the Infrastructure Element.~~

~~FLOODPLAINS~~

~~The Town of Palm Beach can experience flooding from Lake Worth, the Atlantic Ocean, or from surface accumulation of rainwater. Map V-2, in the companion volume *Supporting Documentation*, shows areas in the Town which are subject to flooding during a "one hundred-year storm", as identified on the Flood Insurance Rate Maps (FIRM) prepared by the Federal Emergency Management Agency (FEMA). Land along the Atlantic is also subject to tidal surge and wave velocity in the event of a major storm, although no structures lie within the velocity zone. Nearly all of the flood prone area is already developed.~~

~~GROUNDWATER~~

~~The Town promotes recharge through its stormwater retention requirements, and through minimum landscaped area requirements, which ensure pervious areas for water percolation into the aquifer. In addition, there are few septic tanks in the Town, no existing or known potential problems with hazardous waste contamination, and no known sources of potential aquifer contamination or depletion. In the event that the Town chooses to use the surficial aquifer more extensively, measures should be taken to protect the aquifer from salt water intrusion.~~

~~POTABLE WATER~~

~~Potable water resources, needs, and conservation methods are explored in the Potable Water sub-element of the Infrastructure Element. Specifically, water sources are discussed under the heading "Facilities, Treatment, and Capacity"; needs and water quantity under "Present and Future Needs"; water quality under "Potable Water Quality"; and, conservation under "Water Conservation.~~

~~NATURAL RESOURCES~~

~~Vegetation and Wildlife~~

~~A variety of mammals, reptiles, birds, aquatic species, and other animals live in and around Palm Beach. These are generally attracted to specific vegetational and aquatic communities. The Atlantic Ocean and its associated beaches, dunes and nearshore reef outcrops support a variety of animal life and marine species. Chart V-1 summarizes and describes the various ecological communities in terms of their vegetation, wildlife and ecological needs.~~

Most native wildlife in Palm Beach is centered around remaining natural communities. However, there are also a variety of species which have adapted to the urban environment. Among these are the red fox, possum, raccoon, squirrel, rat, mouse, songbirds (including a flock of wild parrots), and shore birds. The Town is a dedicated Bird Sanctuary.

A patchy series of nearshore and offshore reefs or rock outcrops lies parallel to the Town's Atlantic coastline. Offshore areas are subject to variability. Some nearshore areas can have a very limited diversity or density of species due to naturally high sedimentation rates and low rock relief. Others may support relatively rich populations of plant and animal life. As a rule, diversity and abundance of species increase with greater water depth and distance from the shore. However, site specific studies need to be conducted to determine the ecological value of any given offshore environment.

The Lake Worth Lagoon supports a rich variety of wildlife. The spoil islands in the Lagoon serve as bird rookeries for ibis, reddish and snowy egrets, anhingas, great blue herons, night herons, and tricolor herons, many of which are listed as threatened or endangered species by State or Federal agencies. Fisherman's Island, Hunter's Island, John's Island, and Bingham Island are leased by the Audubon Society specifically as rookeries and bird sanctuaries. Native wetland areas along the shore of the Lake Worth Lagoon serve as roosting areas for these birds, and also provide food and shelter for a variety of small mammals.

Although the Florida Department of Environmental Protection (FDEP) has prohibited shellfishing in the Lake due to its poor water quality, shellfish beds are located on tidal flats and around the periphery of spoil islands. One species of oysters live on the prop roots of red mangroves. A unique sub-specie of clam, native to the area, lives in the sand of the Lagoon.

Air and Other Physical Conditions

The Town of Palm Beach has very good air quality. There are no point sources of pollution within the Town. Increased mobile pollution sources, including automobiles and air traffic, will continue to cause a concern. Air quality is enhanced by the Town's location on the coast, where it benefits from regular sea breezes. Air quality is also improved by the profuse vegetation in the Town, which naturally purifies the air.

The Town should continue to maintain its good air quality by preventing industries from operation in the Town; discouraging increased commercialism; and, maintaining and encouraging rich vegetation on both public and private properties.

The Florida Mining Atlas identifies two potentially valuable mineral resources in Palm Beach: coquina and sand. However, the exclusive residential nature of the Town and subsequent high real estate values preclude any mining of these resources, either presently or in the future.

The Town addresses wind-borne soil erosion due to demolition or construction through its Fugitive Dust and Blowing Sand Ordinance, which requires exposed soils and fill to be stabilized with

~~webbing. In addition, the Town requires unvegetated.~~

RELOCATED TO THE TOWN OF PALM BEACH COASTAL MANAGEMENT ELEMENT SECTION AND EDITED

HISTORY OF FLORIDA'S CONSERVATION EFFORTS

Florida is one of the few states in the eastern United States with large natural areas remaining. With most of Florida relatively isolated as a peninsula, ecological connectivity is at a premium and more of an issue in Florida than elsewhere in the country. Protection of such connections requires careful analysis and planning. In addition, Florida has a combination of unique and highly diverse ecosystems, prized by both residents and Florida's many visitors. **2** Acquisition of land by the State takes into consideration the proximity of land for purchase to promote interconnectivity of ecosystems to promote biodiversity and wildlife corridors throughout the State.

The draining of the Everglades in the 1930s began an era of rampant growth in Florida. By the 1950s, Florida's population had risen at an annual rate of approximately four (4) percent. Since then, more than eight (8) million acres of forest and wetland habitats (about 24% of the State) have been eliminated for development, thereby, threatening Florida's ecosystems.**3**

The Homestead Canal joining Lake Ingraham in the far distance.
Everglades National Park

In 1964, the State first began setting aside money to purchase public land with the Land Acquisition Trust Fund (LATF). This fund focused on buying properties for outdoor recreation and conservation. Starting in the 1970s, Florida legislators began a series of initiatives to attempt to better balance burgeoning development with natural resource conservation. The State passed

2 https://floridawildlifecorridor.org/wp-content/uploads/2011/12/FWC_History_11_09_2015.pdf
3 https://floridadep.gov/lands/lands-director/content/history-state-lands

legislation to manage water resources more effectively through the creation of the Water Management Districts. In addition, Florida began to fund land conservation efforts, and through landmark growth management legislation, new laws were put in place to reduce the impacts of new growth on the environment.

The State of Florida's environmental efforts to buy tracts of land for protection increased with the passage of the Environmental Land and Water Management Act of 1972. This action also led to the Land Conservation Act, which allotted $200 million to buy environmentally endangered lands (EEL) and another $40 million to enhance outdoor recreation lands. The Conservation and Recreational Lands (CARL) program was established by the Florida legislature in 1979 to acquire lands of environmental and cultural significance.**4**

~~**The CARL management funds were allocated annually to the Florida Division of Historical Resources to provide land managers with the necessary information to effectively manage archaeological and historical resources on land purchased or proposed for purchase through conservation lands programs. Through these conservation land purchases that were typically managed as state preserves, state parks, historic sites, or wildlife management areas, the State of Florida acquired many properties of considerable archaeological significance. Many undiscovered sites existed on public lands, but they were not well known due to a general lack of systematic, professional archaeological surveying.5 All of these trends helped support further development of Florida's landscape conservation strategies embodied in proposals and plans to protect wildlife corridors and ecological networks starting in the mid-1980s.6**~~

The history of Florida's land conservation movement rose from the realization that as Florida's population continues to grow, increasing demands would be placed on the State's natural resources. As a result, former Governor Bob Martinez created a Blue-Ribbon Commission in 1990 to evaluate the State of Florida's environment. The Commission conducted its work and issued a report that stated, "at the 1990 rate of development, about three (3) million acres of wetlands and forests would be converted to other uses by the year 2020". The report also predicted the decline of much of Florida's freshwater aquifer recharge areas, unique ecological diversity, open space, recreation lands and many of the state's 548 species of endangered and threatened plants and animals.

The Commission concluded that "the single most effective way to accomplish large-scale gains in our environmental well-being is to substantially increase the level of funding for the State's land acquisition programs". As a result of the report, the CARL program was replaced by Preservation 2000 and the funding increased to $3 billion for conservation land purchases.**7**

~~**The former Governor Martinez then proposed a $3 billion land preservation fund based upon $300 million in yearly bonded funds over 10 years. Florida lawmakers agreed with the**~~

4 https://dos.myflorida.com/historical/archaeology/public-lands/program-history/
5 Ibid
6 https://floridawildlifecorridor.org/wp-content/uploads/2011/12/FWC_History_11_09_2015.pdf
7 https://floridadep.gov/lands/lands-director/content/history-state-lands

~~proposal and in 1990 provided funding for the first year of bonds in the form of an increase in documentary stamp tax. Preservation 2000 established a mechanism for supplemental funding of existing land acquisition programs. Preservation 2000 funds were distributed to the following programs.8~~

- ~~50%: Conservation and Recreation Lands.~~
- ~~30%: Water Resources.~~
- ~~10%: Local Government Comprehensive Plan Implementation.~~
- ~~2.9%: Wildlife Management Areas (additions).~~
- ~~2.9%: State Forests (additions).~~
- ~~2.9%: State Parks (additions).~~
- ~~1.3%: Greenways and Trails.~~

Preservation 2000 preserved more than 1.8 million acres of conservation land throughout Florida. These lands have helped preserve Florida's biological heritage and ensure that future generations will be able to experience the remaining remnants of natural Florida. The program was successful in saving many of Florida's fragile environmental habitats and spawning local community conservation efforts. More than 20 local governments in Florida matched state funds to purchase environmentally sensitive lands to fulfill their conservation needs.**9**

On June 7, 1999, former Governor Jeb Bush signed a bill creating a land conservation initiative called "Florida Forever," which succeeded the Preservation 2000 program. Florida Forever became effective in 2000. ~~The then-Governor Bush heralded Florida Forever as "the nation's most progressive effort to conserve and preserve land and natural resources."~~ ~~Florida Forever broadened the land purchasing criteria to include historical preservation.10 The Legislature added several more reporting requirements, provided for more prioritization of projects within additional categories and provided for spending Florida Forever funds on capital improvements on state-owned conservation lands.~~

FLORIDA FOREVER
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

~~The list of programs funded, and the distribution of those funds was changed, as follows.~~

- ~~35%: Conservation and Recreation Lands.~~
- ~~30%: Water Resources.~~
- ~~21%: Florida Communities Trust.~~
- ~~3.5%: Rural and Family Lands.~~
- ~~2.5%: Working Waterfronts.~~
- ~~1.5%: Wildlife Management Areas (additions).~~

8 Ibid
9 Ibid
10 https://dos.myflorida.com/historical/archaeology/public-lands/program-history

- ~~1.5%: State Forests (additions).~~
- ~~1.5%: State Parks (additions).~~
- ~~1.5%: Greenways and Trails.~~
- ~~2.0%: Development of Recreation Facilities.~~

As Florida's estuaries and offshore waters support one (1) of the largest commercial and recreation marine fishing industries in the nation, it relies on undisturbed estuarine and coastal systems. Preservation 2000 and Florida Forever helped save many of Florida's beaches, rivers, bays, forests, coral reefs, and estuaries that provide the foundation for the State's $3 billion tourism industry, which attracts more than 70 million visitors each year.**11**

~~Florida Forever has become Florida's primary environmental land acquisition initiative. As a result, the program is an integral component of the conservation landscape in the State. Florida Forever and its landmark predecessor program, Preservation 2000, together are responsible for acquisition of more than two (2) million acres of the most significant natural areas in Florida since 1990. The State of Florida has invested approximately $300 million per year towards Florida's future through the purchase of the state's most important lands and waters for conservation. These programs offer the opportunity to conserve and protect Florida's biological and cultural elements for future generations to enjoy.12~~

~~For over 50 years the State of Florida has continued to execute substantial land acquisition programs to save native landscape from development, including the following.~~

- ~~✓ 1968: Established a $20 million bond program to acquire outdoor recreation lands.~~
- ~~✓ 1972: Allocated an additional $40 million for an outdoor recreation bond and established a $200 million Environmentally Endangered Lands (EEL) program.~~
- ~~✓ 1979: Established the Conservation and Recreation Lands (CARL) program.~~
- ~~✓ 1981: Developed Save Our Coast (SOC) and Save Our Rivers (SOR) programs.~~
- ~~✓ 1990: Established the Florida Preservation 2000 (P2000) program.~~
- ~~✓ 2000: Started the Florida Forever program.~~

STATE REQUIREMENTS FOR THE CONSERVATION ELEMENT

Pursuant to §163.3177(6)(d), Fla. Stats. a Conservation Element is required for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, waterwells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources, including factors that affect energy conservation.

The following natural resources, if present within a local government's boundaries, are required to be identified and analyzed if any known pollution problems, including hazardous waste are present.

11 https://floridadep.gov/lands/lands-director/content/history-state-lands
12 Ibid

- Rivers, bays, lakes, wetlands including estuarine marshes, groundwaters, and springs, including information on quality of the resource available.
- Floodplains.
- Known sources of commercially valuable minerals.
- Areas known to have experienced soil erosion problems.
- Areas that are the location of recreationally and commercially important fish or shellfish, wildlife, marine habitats, and vegetative communities, including forests, indicating known dominant species present and species listed by federal, state, or local government agencies as endangered, threatened, or species of special concern.

Additionally, the Conservation Element is required to contain principles, guidelines, and standards for conservation that provide long-term goals that address the following.

- Protects air quality.
- Provides for the emergency conservation of water sources in accordance with the plans of the Regional Water Management District.
- Conserves and protects minerals, soils, and native vegetative communities, including forests, from destruction by development activities.
- Conserves and protects fisheries, wildlife, wildlife habitat, and marine habitat and restricts activities known to adversely affect the survival of endangered and threatened wildlife.
- ~~Protects existing natural reservations identified in the recreation and open space element.~~
- Maintains cooperation with adjacent local governments to conserve, appropriately use, or protect unique vegetative communities located within more than one local jurisdiction.
- Designates environmentally sensitive lands for protection based on locally determined criteria which further the goals and objectives of the conservation element.
- ~~Manages hazardous waste to protect natural resources.~~
- Protects and conserves wetlands and the natural functions of wetlands.
- ~~Directs future land uses that are incompatible with the protection and conservation of wetlands and wetland functions away from wetlands.~~
- ~~Projects current and projected needs and sources for at least a 10-year period based on the demands for industrial, agricultural, if applicable, and potable water use and the quality and quantity of water available to meet these demands shall be analyzed.~~

TOWN OF PALM BEACH CONSERVATION ELEMENT

The Town of Palm Beach lies entirely within the coastal zone. By definition, a coastal zone includes beaches, islands, salt marshes, wetlands, and some adjacent inlands.**13** Accordingly, the Town's Conservation Element serves to promote the conservation and protection of natural and wildlife coastal resources that are prevalent in the Town and in compliance with Chapter 163.3177, F.S.

NATURAL RESOURCES

A variety of mammals, reptiles, birds, aquatic species, and other animals live in and around the Town of Palm Beach in a ~~variety~~ **diversity** of ecological communities as listed in Table 9-1. These animals are generally attracted to specific vegetation and aquatic habitats. The Atlantic Ocean and its associated beaches, dunes and nearshore reef outcrops support a variety of animal life and marine species. The Summary of Ecological Communities provided below describes the various ecological communities in terms of their vegetation, wildlife, and ecological needs.

Table 9-1
SUMMARY OF ECOLOGICAL COMMUNITIES IN THE TOWN OF PALM BEACH

COMMUNITY	ATLANTIC OCEAN	ATLANTIC BEACH & DUNES	BARRIER ISLAND INTERIOR	LAGOONAL WATER'S EDGE	LAGOON	MANGROVE ISLAND
DESCRIPTION	Zone begins 3 miles east of the MHW line & extends west through the breaking surf to the MHW lines.	Area extends from the MHW line of the beach to the trough behind the dune zone.	West of dunes to the edge of the Lake Worth Lagoon.	Wetland Bordering Lake Worth Lagoon	Lake Worth	Various natural and spoil islands in Lake Worth
SOILS	Submerged, unconsolidated sand; coquina outcroppings from reefs.	Well drained sand and shells.	Moderately drained sand, and urban fill.	Well drained sand and shells overlying organic layer of poorly drained peat.	Submerged, unconsolidated sand	Composition ranges from mixed sand and shells to organic materials
VEGETATION	Plankton, sarragussum, seaweed, red	Salt tolerant dune	Live oak, slash pine, cabbage palm, saw	Black, red & white mangroves, salt	Sea grass beds	Red and black mangroves, Australian pine

13 https://www.fema.gov/pdf/plan/ehp/final_f.pdf

	and brown algae.	grasses, herbaceous plants, vines, shrubs, and stunted trees.	palmetto; invasion by Australian pine, Brazilian pepper.	marsh grass; invasion of Brazilian pepper & Australian pine.		and Brazilian pepper on upland spoil areas; some hardwoods on native island uplands
LISTED SPECIES	Brown pelican. Sea turtles (see Beach and Dunes). Sea Gulls.	Atlantic loggerhead turtle Atlantic green turtle Leatherback turtle Atlantic hawksbill turtle Atlantic Kipp Ridley turtle Sea lavender Prickly pear Roseate tern Least tern Osprey Sea Oats Sea Grape		Roseate tern Least tern Atlantic saltmarsh snake Snowy egret, reddish egret Southern Kestrel Southern bald eagle Great Blue heron, Little Blue heron, other herons Other shorebirds Anhingas Cormorant Osprey	West Indian Manatee	Roseate tern Least tern Atlantic saltmarsh snake Snowy egret Southern Kestrel Southern bald eagle Great Blue and other herons Limpkin White ibis Osprey
NATURAL FUNCTION	-Marine habitat -Moderation of climate	-Wind & wave protection for island -Shoreline maintenance -Interface between marine & terrestrial wildlife -Shallow aquifer recharge	-Wildlife habitat -Shallow aquifer recharge in elevated areas -Vegetation purifies air	-Shoreline stability -Maintenance of water quality -Wildlife habitat -Detrital source -Important nursery area for marine wildlife	-Feeding area for manatees -Source of detrital food web -Vital nursery habitat for larval & juvenile stages of marine life -Maintenance water quality	-Habitat, rookeries for birds -Maintenance of water quality -Maintenance of marine life -Detrital source

		(dunes)				
ELEMENTS ESSENTIAL TO NATURAL FUNCTION	-Good water quality	-Natural beach profile -Uninterrupted littoral drift -Natural dune form -Hardy vegetation -Good water quality	-Vegetation -Good water quality	-Healthy and prolific vegetation -Good water quality	-Good water quality -Natural circulation -Undisturbed bottom	-Healthy vegetation -Good water quality -Minimal disturbance by man
POST DEVELOPMENT CHARACTER	-Water pollution (oil) from residue and garbage)	-Intense development of primary dune area -Removal of foredune and replacement with bulkhead -Breaches of dune due to pedestrian and vehicular activity	-Most of area heavily urbanized. Native vegetation replaced with exotic landscaping	-Most of wetland edge filled and elevated for residential development and cleared of natural vegetation -Shoreline hardened -Invasion of exotic vegetation	-Some areas dredged for boat channels -Seagrass loss due to poor water quality, dredge and fill -Habitat loss for marine organisms	-Invasion of exotic vegetation -Litter -Disturbance by boaters, trespassers

Most native wildlife in the Town of Palm Beach is centered around remaining natural communities. However, there are also a variety of species which have adapted to the urban environment. Among these are the red fox, possum, raccoon, squirrel, rat, mouse, songbirds, including a flock of wild parrots, and shore birds. **14**

14 Ibid

A patchy series of nearshore and offshore reefs or rock outcrops lies parallel to the Town's Atlantic coastline. Offshore areas are subject to variability. Some nearshore areas can have a very limited diversity or density of species due to naturally high sedimentation rates and low rock relief. Others may support relatively rich populations of plant and animal life. As a rule, diversity and abundance of species increase with greater water depth and distance from the shore. However, site specific studies need to be conducted to determine the ecological value of any given offshore environment.


Red Mangrove Forest

With regard to coral reefs, Florida is the only state in the continental United States with extensive shallow coral reef formations near its coasts. Coral reefs create specialized habitats that provide shelter, food and breeding sites for numerous plants and animals. Coral reefs lay the foundation of a dynamic ecosystem with tremendous biodiversity. Florida's Coral Reef stretches approximately 360 linear miles from Dry Tortugas National Park west of the Florida Keys to the St. Lucie Inlet in Martin County. The reefs stretching north of Biscayne National Park and the marine sanctuary are managed by the Florida Department of Environmental Protection's Coral Reef Conservation Program (CRCP) with insight from the Southeast Florida Coral Reef Initiative, which is one of several programs administered by the CRCP. 15

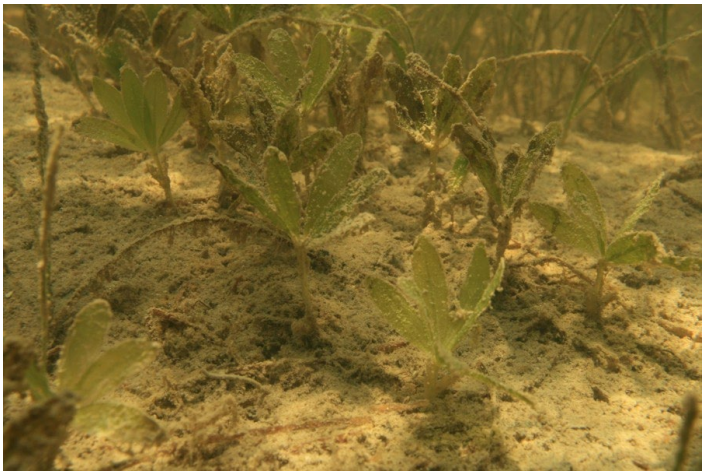
An artificial reef is a manmade structure that mimics some of the characteristics of a natural reef. Florida has one of the most active artificial reef programs in the country, with more than 3,800 deployed since the 1940s. 16 For the past 40 years, Palm Beach County has created reef areas using various materials including limestone, concrete, and decommissioned ships that have become marine habitats for algae, corals and other marine life. Off the coast of the Town of Palm Beach extending three (3) miles out, lies 29 artificial reefs. (See Map 9.3)

Seagrasses are grass-like flowering plants that live completely submerged in marine and estuarine waters. Seagrass provides food and habitat to numerous species, stabilize the ocean bottom, maintain water quality, and help support local economies.17 Palm Beach County Environmental Resource Management Department oversees the implementation of the Lake Worth Lagoon Management Plan that contains achievable goals and actions for improving water quality, enhancing habitat, protecting fish and wildlife, preparing for a changing

15 Floridadep.gov/rcp/rcp/content/floridas-coral-reefs#
16 Flseagrant.org/fisheries/artificial-reef-deployment-and-monitoring
17 Florida Department of Environmental Protection (DEP), Florida Seagrass,

climate, and fostering public awareness and responsible enjoyment of the Lagoon over the next decade.

Researchers believe that the majority of seagrass loss can be primarily attributed to reduced availability of light, which often coincides with blooms of phytoplankton. Intense blooms increase the amount of shading and result in the loss of seagrasses. Blooms occur in waters that have high concentrations of nutrients, particularly nitrogen and phosphorus, from nonpoint source pollution. Common nonpoint source pollution sources include sediment, leaf litter, pet waste, landscape inputs such as fertilizers, herbicides and insecticides, and nutrients from septic systems. Run-off is a major problem because it changes water quality and reduces the amount of light reaching the plants. While salinities and temperature can reach levels that cause stress to the grasses, these effects can be mitigated if enough light is available.



Johnson's Seagrass, Federally Threatened Species

The Town is home to three (3) endangered sea turtles, the loggerhead, green turtle, and leatherback. According to the Sea Turtle Conservancy, the Town of Palm Beach averages more than 20,000 loggerhead nests per year, with upwards of 2,000 green turtle nests and around 100 leatherback nests. Pursuant to Code Section 74-222, all oceanfront property owners are required to ensure that no artificial light shall illuminate any area of the beach or water that may be used by nesting sea turtles and hatchlings. In order to accomplish this, the Town requires that all lighting be positioned or shielded so that light is not visible from the beach or water during the period from March 1 through October 31 of each year.

The Lake Worth Lagoon supports a rich variety of wildlife. In fact, the Town is a dedicated Bird Sanctuary. Along the shore of the Lake Worth Lagoon exist native wetland areas that serve as roosting areas for a number of birds, and also provide food and shelter for a variety of small mammals. The spoil islands in the Lake Worth Lagoon serve as bird rookeries for Ibis, Reddish and Snowy Egrets, Anhingas, Great Blue Herons, Night Herons, and Tricolor Herons, many of which are listed as threatened or endangered species by State or Federal agencies. In fact, 70 years ago, the identification of Herons, Egrets, and Pelican's nestings on several small islands in Lake Worth Lagoon, led the Audubon Society to designate the islands as bird sanctuaries. Fisherman's

Island, Hunter's Island, and Bingham Island, displayed on the Spoils Islands of Palm Beach as shown on Map 9.1 of the Map Series and shown below, are leased by the Audubon Society and managed as rookeries and bird sanctuaries. Additionally, shellfish beds are located on tidal flats and around the periphery of spoil islands. One (1) species of oysters live on the prop roots of red mangroves. A unique sub-species of clam, native to the area, also live in the sand of the Lagoon.[18] These unique lagoon islands offer the following amenities.[19]

The Bingham Island - Audubon Society Photo

- Meditative respite for connecting with nature.
- Subtropical hardwood hammocks and mangrove forests.
- Nesting and roosting areas for the birds of Lake Worth Lagoon

The Town's Code of Ordinances specifically speaks to the wildlife protection in Chapter 66, Article V. The Code recognizes that various species of animals found in the Town have been classified by the State Game and Freshwater Fish Commission as Endangered, Threatened, or Species of Special Concern, reflecting a depletion in population so critical that extinction is possible. As these species may be of aesthetic, ecological, educational, historical, recreational, economic or scientific value, the Town seeks to preserve a stable ecosystem, which is dependent upon the number and diversity of constituent species. The protection of these species requires preservation of occupied habitat, protective buffers and adequate management measures.

Map 9-1 Spoil Islands of Palm Beach

The majority of the Town's natural resources are concentrated along shoreline areas. The beaches are the focus of swimming, walking, snorkeling, and surfing activities. Vistas to the Ocean and

18 Ibid
19 Ibid

Lake Worth Lagoon are valued accommodations. As such, the natural environment in the Town of Palm Beach is almost exclusively used for recreation and aesthetic enjoyment. **20**

Lake Worth Lagoon is also used to moor boats and to obtain access to the Intracoastal Waterway **Code Section 74-268, Mooring in Lake Worth, prohibits anchoring or mooring of any liveaboard vessel in any of the waters of Lake Worth lying within the Town's corporate limits unless it is moored in a marina, designated mooring area, or at a dock located adjacent to a house that has running water, toilet facilities and garbage collection available for use by the vessel.** No commercial fishing industries operate from Palm Beach

Of the Town's 12 miles of shoreline, approximately 4,760 linear feet, or approximately 8%, are accessible for public **use** ~~**bathing**~~ and recreational purposes. Of this, about 4,245 linear feet are in Town ownership, and 515 linear feet is owned by the County. The City of Lake Worth's "Casino Complex" includes an additional 1,300 linear feet of public beach which is located between Kreusler Park and the southernmost 1.2 miles of the Town. There are also several street ends that provide public access to the beach in the northern part of Town. The majority of remaining native shoreline vegetation is located on narrow undevelopable strips along State Road A1A, or on spoil islands in the Lake Worth Lagoon (Map 9-1). Mangroves are protected by a Town ordinance, and by State and County regulations. The Army Corps of Engineers and the State Department of Environmental Protection also have authority if dredge and fill activity is involved. 21

Water Quality

Stormwater discharge is a major water quality problem for the Town. Drainage improvements have focused on eliminating flood-prone pockets on the Island rather than on improving water requirements. New developments must retain the first two (2) inches of rainfall to prevent any further degradation of water quality from this source. It is more difficult, however, to remedy existing sources of stormwater runoff since the high-water table would require large surface areas for retention. Given the fact that the Town is virtually fully developed, there is little or no opportunity to create new upland retention areas which would allow infiltration and settling prior to discharge into the Lake. Exfiltration drainage systems, which operate underground, are also limited by the highwater table.**22**

The Town of Palm Beach is a participant of the Palm Beach County National Pollutant Discharge Elimination System (NPDES) MS4 Permit. The PBC MS4 NPDES permit is held jointly by most MS4 owners within the geographic area of Palm Beach County. The permittees have taken a cooperative approach to permit compliance, jointly conducting several permit activities, and collectively developing a number of tools used to carry out the permit programs.

20 Ibid
21 Ibid
22 Ibid

Air Quality and Mining

Gases that trap heat in the atmosphere are called greenhouse gases. Carbon dioxide (CO_2) is the primary greenhouse gas emitted through human activities. In 2021, CO_2 accounted for 79% of all U.S. greenhouse gas emissions from human activities. Carbon dioxide is naturally present in the atmosphere as part of the Earth's carbon cycle (the natural circulation of carbon among the atmosphere, oceans, soil, plants, and animals). Human activities are altering the carbon cycle–both by adding more CO_2 to the atmosphere and by influencing the ability of natural sinks, like forests and soils, to remove and store CO_2 from the atmosphere. While CO_2 emissions come from a variety of natural sources, human-related emissions are responsible for the increase that has occurred in the atmosphere since the industrial revolution.**23**

The Department of Energy manages an Energy Efficiency Conservation Strategy that consists of four (4) long-term goals that consist of the following. **24**

- Reduce energy consumption.
- Reduce greenhouse gas (GHG) emissions,
- Implement the Electric Vehicle Fleet Plan.
- Expand recycling options.

The Town of Palm Beach does not identify any point sources of pollution within the Town. However, increased mobile pollution sources, including automobiles and air traffic, will continue to cause a concern. As the Town is a barrier island surrounded by water, air quality is enhanced as the Town benefits from regular sea breezes. Air quality is also improved by the abundance of vegetation in the Town, which naturally purifies the air. Further, the Town's air quality benefits by preventing industrial uses in the Town and maintaining and encouraging rich vegetation on both public and private properties. Although the Town of Palm Beach has good quality air, the reduction of greenhouse gas emissions will further improve the air quality while contributing to broader climate change efforts.

~~**Beach and Dune Conditions**~~
MOVED TO THE COASTAL MANAGEMENT ELEMENT

~~Beach erosion has been a continuing problem for the Town since 1924 when the Lake Worth Inlet was deepened and stabilized with jetties on either side. Sand immediately began to build up in the north jetty as the southerly littoral drift was interrupted. The beaches on the north side of the Inlet began to experience accretion, while those to the south, where the Town is located, suffered from erosion. Sand starvation caused by the Inlet has combined with other factors, such as the rising sea level and numerous storm events, resulting in a dramatic and continuing loss of beach. Through the years the Town has responded to beach erosion with shore protection structures, artificial beach nourishment, and a sand bypass program at the Inlet.~~

~~The Town has carefully controlled beach protection through a beach management plan, passed in~~

23 https://www.epa.gov/ghgemissions/overview-greenhouse-gases
24 Ibid

1935, which designates the locations, dimensions, and lengths of bulkheads and groins within the municipal limits of the Town. Since 1935, protective structures have generally been placed in accordance with this Plan.

Comprehensive Coastal Management Plan

MOVED TO THE COASTAL MANAGEMENT ELEMENT

Recognizing the importance of managing its beach resources, the Town commissioned Cubit Engineering to prepare its Comprehensive Coastal Management Plan (CCMP). This report, dated August, 1986, contained the following eight (8) major objectives. The Town's progress towards meeting the original objectives is shown in italics beneath each.

1. Replace the sand bypass plant at Lake Worth Inlet.

   The Sand Transfer Plant ceased operation in May, 1990. The County, who operated the plant under an interlocal agreement, reported that its condition was beyond normal maintenance repair. The Town has funded the restoration of the Sand Transfer Plant which should provide enhanced transfer capability. Two new discharge pipes under the inlet, a new pump, motor and electrical system were installed in November, 1995.

   The Town began a study of the Lake Worth inlet through the initiation of the Lake Worth Inlet Management Plan. The Plan, with 75% State funding, will explore the optimal way to move sand past the Lake Worth Inlet. The Plan has already recommended replacement of the transfer station with upgraded bypass capabilities. It is anticipated that the Plan will be completed in the near future. Upon completion, the Town will implement it with the assistance of the U.S. Corps of Engineers and Florida Department of Environmental Protection.

   The Sand Transfer Plant was structurally and mechanically rehabilitated by the Town in late 2009 and early 2010. Following rehabilitation, the plant successfully bypassed sand until impacts from Hurricane Sandy damaged the plant's infrastructure in October 2012. The plant was operational again in mid-2013 and regularly bypassed sand until electrical connection issues persisted in 2015. The electrical connections were replaced and the Sand Transfer Plant has been in continual operation through much of 2016.

   In June 2016, by Resolution No. 94-2016, Town Council approved an interlocal agreement with Palm Beach County that details responsibilities for operation and maintenance of the Sand Transfer Plant until September 2035. The interlocal agreement obligates the County to operate and maintain the plant and obligates the Town to be responsible for repairs. This agreement was approved by the Palm Beach County Board of County Commissioners in August 2016.

2. Require all sand bypass plant discharge and beach quality maintenance dredge spoil

to be placed south of Onondaga Avenue so that it will be of greatest benefit.

The Town manages the Sand Transfer Plant consistent with the FDEP-adopted Lake Worth Inlet Management Plan (IMP) of 1995, the FDEP Palm Beach Island Beach Management Agreement (BMA) of 2013, and the FDEP Strategic Beach Management Plan updated in 2015. Both the IMP and BMA recommend lengthening the discharge pipelines and to allow for multiple discharge points to be located as far as 2,500 feet south of the south jetty. The State's strategy for inlet bypassing, which includes the combination of the operation of the sand transfer plant and beach placement of maintenance dredge material from the federally authorized navigation channel, to place all beach compatible material on the downdrift beaches of Reach 1 and in an extended beach placement in Reach 2. The FDEP Strategic Beach Management Plan details that an extension of the plant's discharge pipeline can be sited as far as 3,600 feet south of the south jetty.

3. Renourish the Mid-Town Public Beach to enhance that area and provide downcoast property protection.

   The Town's Mid-Town Beach Restoration project, with the construction of groins to stabilize the beach, began in October, 1995, and was completed in March, 1996. Following the project, a dune vegetation project was initiated for approximately 4,000 feet of the project. Mid-Town Beach was renourished in 2003 and 2006 following hurricanes Frances and Jeanne. A Mid-Town Beach Renourishment Project was constructed in 2015.

4. Endorse the Department of Transportation revetment at Widener's Curve to Sloan's Curve.

   The revetment is in place.

5. Maintain the seawalls to ensure that storm protection to upland property and infrastructure is provided.

   Seawalls are maintained on an "as needed" basis. Construction of a replacement seawall fronting North Ocean Boulevard across from the Palm Beach Country Club in Reach 2 was completed in 2016.

6. Maintain and/or modify only those groins that are presently effective; abandon and remove all others as may be physically and financially practical.

   The BMA included the repair, rehabilitation, or removal of groins in Reaches 2, 4, 5, and 6 as an authorized activity to maintain sand placement projects. In February 2015, a Town consultant completed a Groin Rehabilitation Execution Plan that outlines a multi-phased long-term effort to maintain, modify, abandon, or remove groins, as necessary. The first phase of implementation may occur

following Town Council direction after the federal permitting process has been completed.

7. Enhance the dune areas with vegetation and sand fence techniques between Sloan's Curve and Kreusler Park.

The Phipps Ocean Park Beach Restoration was undertaken and completed in 2006 between Phipps Park and the Ambassador Hotel. A dune vegetation restoration project was also completed there in 2007. Nourishment of Phipps Ocean Park and Reach 7 was completed in 2016. This project extended beach nourishment from the Ambassador Hotel to Kreusler Park. Following the nourishment of sand, dune vegetation was planted along the entire Town-portion of Reach 7, which extends from Sloan's Curve to Kreusler Park.

8. Monitor the Town's beach to develop a better data base of information concerning beach characteristics so that future planning decisions can be made."

The Town performs a yearly shoreline survey to design and monitor beach restoration and renourishment activities.

The Comprehensive Coastal Management Program (CCMP) includes a detailed schedule and budget. The scope and cost of the CCMP is reviewed annually by Town staff, the Shore Protection Board, and Town Council. The Town continues to implement the CCMP objectives. The Town Council appointed a Shore Protection Board on July 11, 1995, to investigate and evaluate the Town's beaches and develop a plan to address the erosion of this piece of the Town's infrastructure. The Board met regularly for over three years. After investigating the broadest array of beach management options, the Board oversaw the production of the (CCMP) Update, dated September 1997, by Applied Technology & Management, Inc. Thereafter the Board oversaw a separate Peer Review of the CCMP. The Peer Review emphasized that uncertainty exists in the science of managing our coastal resources, and therefore recommended that the CCMP by Aubrey Consulting, Inc. (later referred to as Woods Hole Group, Inc.) be implemented in phases, thereby allowing for flexibility and adjustments through a process called "adaptive management.". This process involves incorporating specific, measurable goals in each beach nourishment project and learning from the observed successes and failures, or outcomes of those projects when compared against the projects original expectations. Summarizing the process below:

(1) Monitoring the implementation of each project in a manner meant to reveal any critical knowledge that was lacking in the project's original design,

(2) Analyzing the outcome of each project against its original objectives, and

(3) Incorporating these results into future decisions regarding the projects included in the adopted CCMP by means of appropriate mid-course corrections.

In January of 1999, the Shore Protection Board issued its final report, making a number of recommendations to the Mayor and Town Council, including the implementation of the CCMP through adaptive management.

The Town Council reviewed the CCMP, and held three public meetings throughout the Town to receive input into the decision-making process. The CCMP was further discussed at Town Council meetings over a number of months where public debate continued. Some citizens raised concerns about the environmental damage that might be caused by the projects, the method of apportioning the costs of the projects (having them spread among all property owners in the Town in contrast to just beachfront property owners), and the potential effects of creating the Erosion Control line on the privacy and property rights of the Town's residents. The Town Council adopted a scaled-back Coastal Management Plan on December 1, 1999. That action and the Town Council's subsequent actions on these projects substantially outweigh the potential negative impacts. The prevailing opinion expressed by the residents at the Community Forums in November 2001 strongly supported this determination.

The CCMP update of 1999 summarized the 1986 CCMP objectives and included the following key action elements:

- Implement the Lake Worth Inlet Management Plan;
- Construct sand retention structures and restore and maintain beaches along the designated Reaches;
- Implement a comprehensive coastal monitoring and modeling program;
- Maintain, restore and/or replace existing coastal structures; and
- Renourish restored reaches periodically to sustain project benefits.

With the above listed elements identified to be implemented over a 10-year period, the Shore Protection Board was sunset by Town Council in 1999.

Per Ordinance No. 1-08, on July 8, 2008, the Town Council established that the Shore Protection Board "act in an advisory capacity to the Town Council and shall make recommendations to the Town Council on all matters relating to shore protection in the Town of Palm Beach." On December 9, 2008, Town Council appointed seven (7) members who held their first meeting on December 17, 2008. During their first year, the board developed goals and objectives. With eight (8) objectives identified, the board prepared an Objectives Plan which included data collection, fact-finding, short-term shore protection actions, and long-term coastal management solutions. While assessing the Town's coastal program through their Objectives Plan, the board also applied the twelve (12) conclusions, recommendations, and comments from the previous Shore Protection Board. Projects were prioritized and the Shore Protection Board concluded their first year of meetings with nine (9) specific recommendations to Town Council on November 10, 2009. In addition to the recommendations, the Shore Protection Board provided Town Council with a 10-Year Coastal Management Plan. Although the 10-Year plan was not adopted by Town Council, the document served as the framework for a plan later adopted by Town Council.

In June 2013, following more than one (1) year of peer review performed by Woods Hole Group,

Town Council adopted a long-term 10-Year Plan for the Town's Coastal Management Program. The plan called for implementation of specific projects and monitoring to occur between fiscal years 2014 and 2023.

The Shore Protection Board continues to meet at least four (4) times per year and reports to the Town Council annually. To facilitate civic involvement by its citizens the Town Council adopted Ordinance No. 06-2017 which will impose term limits for the Shore Protection Board members and add three (3) alternate members.

Impacts of the Issue

The impact of shoreline protection and the protection of submerged lands is paramount to the continued quality of life, and perhaps even the survival of Palm Beach. This topic has broad implications from social, economic, and environmental points of view. The issue is not new to Palm Beach since the Town has been dealing with beach nourishment and environmental protection issues for years. The recreational opportunities afforded by the Town's beaches and natural areas constitute the economic foundation for the living environment. It is anticipated that the issues outlined in this section will receive the highest level of priority from the Town Council. The Town's Comprehensive Plan and Zoning Code provide guidance as to the status of submerged lands located within the Town limits.

Submerged land beyond the physical shoreline of Lake Worth and the Palm Beach Inlet within the Town's corporate limits has a future land use designation of Conservation and no land development or redevelopment is allowed. This prohibition does not preclude Palm Beach County, Florida Inland Navigation District or the Army Corp. from creating spoil islands that would be designated Conservation on the Town's Future Land Use Map. Historically, since 1960 (Ordinance No. 3-60, prior to the Comprehensive Plan, as defined by the 1975 Growth Management Act, the Town's land development regulations have not allowed structures, other than docks, constructed over the waters of Lake Worth. The Town continues to vigorously enforce these regulations.

Unanticipated Changes in Circumstances

Although this high priority issue is ongoing, many unanticipated changes in circumstances routinely evolve throughout the implementation process. Funding, availability of federal, state and other revenue sources as well as multi-jurisdictional regulatory review processes affect the timing, scale and scope of these types of projects.

Resulting Problems or Opportunities

Policy 5.6 in the Town's Coastal Management/ Conservation Element identify the bulkhead line in Lake Worth as the mean high water line (MHWL). However, the Town believes that in order to prevent future attempts at development of submerged lands in Lake Worth (with the exception of docks), lands west of the mean high water line shall always be Conservation on the Future Land Use Map.

~~Dunes are created when onshore winds move sand inland from the beach, forming mounds of sand which are trapped and stabilized by specially adapted grasses and herbaceous vines.~~

~~Dunes are easily disturbed by pedestrian and vehicular traffic, which destroy the delicate vegetative fabric holding the sand in place. Small disturbances often develop into large barren areas, or "blowouts", which can be self-perpetuating, ultimately resulting in gaps in the dunes which diminish landward property protection. Many of the dunes in Palm Beach have been built upon, landscaped as part of residential yards, or used as a roadbed. With a seawall fronting the dune, and its other surfaces covered by man-made improvements, the dune has often been transformed from a natural and dynamic element of the shoreline ecology to an essentially stable, topographic feature.~~

~~In some areas of the Town, construction has been limited to the top of the foredune, leaving the seaward slope of the dune principally unaltered. Because these dunes cannot migrate away from the eroding beach, they often experience severe erosion. Examples are scattered throughout the Town but are most evident south of the Lake Worth Municipal Park. These 20' high dunes are experiencing erosion along nearly the entire stretch of beach. As erosion increases, dunes backed by a shore protection structure are likely to begin experiencing erosion as well.~~

~~Phipps Ocean Park has a healthy foredune slope, but is similarly stabilized on and behind the ridge by old State Road A1A, and picnic and parking areas. This dune is mainly vegetated by seaoats, with seagrapes growing on the upper part. Seedlings and pines are removed by the Town's Public Works Department before they damage the native dune vegetation.~~

~~Several dynamic dune systems remain. The Town-owned Par Three Golf Course fronts an undulating series of 15' to 20' dunes mainly vegetated by seaoats with scattered growths of low-lying herbaceous plants. The northern part of the Town, near the Lake Worth Inlet jetties, has a very low series of moderately vegetated dunes. This area receives the benefits of the Inlet sand transfer plant, and thus has a wide, gently sloping beach.~~

~~Dunes are protected by Town Ordinance, which prohibits disturbance of dunes or dune vegetation without a special permit from the Town. The ordinance includes strict vegetation planting and trimming controls, and includes a dune maintenance program.~~

RELOCATED TO THE COASTAL MANAGEMENT AND EDITED

Displayed in Table 9-2, the following soils have been identified in the Town of Palm Beach and illustrated on Map 8-6 of the Map Series.

Table 9-2 Glossary of Soil Science Terms	
Type	**Description**
Arents	Arents is a soil classification that describes manmade land created by earthmovers including areas where fill has been placed, areas where dredging has occurred, and areas where leveling activities have modified the original soils. This classification consists of all soil types, colors and textures, but is dominated by sandy soils. Based on the manmade nature of this category permeability and depth to seasonal high groundwater cannot be determined.
Beaches	The Beach series comprises very shallow and shallow, well drained, moderately permeable soils that formed in residuum from hard, very fine grained, metamorphic sandstone. These sloping to steep soils are on sandstone hills and in valleys. Slopes range from 1 to about 70 percent.
Canaveral-Urban land complex, 0 to 5 percent slopes	The Canaveral series consists of very deep, somewhat poorly to moderately well drained, very rapidly permeable soils on side slopes of dune-like ridges bordering depressions and sloughs along the coast in Peninsular Florida. They formed in thick marine deposits of sand and shell fragments. The mean annual temperature is about 73 degrees Fahrenheit, and the mean annual precipitation is about 55 inches. Slopes are dominantly less than 3 percent but range up to 5 percent.
Cocoa-Urban land complex, 0 to 5 percent slopes	The Cocoa series consists of moderately deep, well drained, rapidly permeable soils on upland coastal ridges. They formed in sandy marine or eolian sediments deposited over coquina limestone. Near the type location, the mean annual temperature is about 74 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 8 percent.
Kesson mucky sand, tidal	The Kesson series consists of deep, very poorly drained, rapid to moderately rapid permeable soils that formed in thick marine deposits of sand and shell fragments in tidal swamps and marshes along

	the Gulf Coast of Peninsular Florida. Slopes range from 0 to 1 percent.
Palm Beach-Urban land complex, 0 to 8 percent slopes	The Palm Beach series consists of very deep, well to excessively drained, very rapidly permeable soils on dune-like ridges that are generally parallel to the coast. They formed in thick deposits of sand and shell fragments. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 60 inches. Slopes range from 0 to 17 percent.
Pomello fine sand, 0 to 5 percent slopes	The Pomello series consists of very deep, moderately well to somewhat poorly drained soils that formed in sandy marine sediments. Pomello soils are on ridges, hills, and knolls in the flatwoods on marine terraces. Slopes range from 0 to 5 percent. Mean annual precipitation is about 1397 millimeters (55 inches) and mean annual temperature is about 23 degrees C (72 degrees F).
Urban land, 0 to 2 percent slopes	Urban land consists of areas that are more than 70 percent covered by shopping centers, parking lots, roadways, buildings, etc. and has no parent material.

Source: US Soil Conservation Services https://soilseries.sc.egov.usda.gov/

Regarding mining, the Florida Mining Atlas identifies two (2) potentially valuable mineral resources in Palm Beach, being coquina and sand. However, the exclusive residential nature of the Town and subsequent high real estate values preclude any mining of these resources, either presently or in the future. Further, the Town addresses wind-borne soil erosion associated with the demolition or construction associated with redevelopment through Chapter 42, Environment, Code of Ordinances, which requires exposed soils and fill to be stabilized with webbing and requires unvegetated vacant areas to be sodded.**25**

Town of Palm Beach Conservation Policies – "The Green Initiative"

The Town of Palm Beach has instituted several conservation policies to prevent habitat loss through the provision of ecofriendly alternatives, referred to as the Town's "Green Initiative". As early as 1982, pursuant to Chapter 66, Article II, the Town recognized the environmental values of native wetland shoreline habitat along Lake Worth Lagoon as they provide habitat for a diverse community of plants and animals; play a fundamental role in estuarine nutrition; provide a nesting and resting ground for species of migratory birds; and are aesthetically appealing and can be reasonably incorporated as an asset into the landscaping of waterfront residences. Code Section

25 Ibid

66-38 requires applications for Future Land Use Map amendments and rezonings, to provide a shoreline management plan whenever alterations or removal of mangroves is requested, or mangroves have been altered or removed in violation. Additionally, Code Section 66-336 provides policy that the Town shall provide for the restoration of native dune systems wherever such opportunities exist as they provide the first defense against wind and waves.

In 2018, the Town of Palm Beach instituted a Fertilizer-Friendly Use Ordinance with the adoption of Chapter 42, Article IX, Code of Ordinances. The Ordinance regulates the proper use of fertilizers by any applicator, requires proper training of commercial and institutional fertilizer applicators, establishes training and licensing requirements, establishes a prohibited application period, and specifies allowable fertilizer application rates and methods, fertilizer-free zones, and exemptions.

The Fertilizer-Friendly-Use Ordinance requires the use of best management practices to minimize negative environmental effects associated with excessive nutrients in our waterbodies. These environmental effects have been observed in and on Palm Beach County's natural and constructed stormwater conveyances, rivers, creeks, canals, lakes, estuaries, and other waterbodies. Collectively, these waterbodies are an asset important to the environmental, recreational, cultural, and economic well-being of Palm Beach County residents and the health of the public. Overgrowth of algae and vegetation hinder the effectiveness of flood attenuation provided by natural and constructed stormwater conveyances. Regulation of nutrients, including both phosphorus and nitrogen contained in fertilizer, is anticipated to help improve and maintain water and habitat quality.

Pursuant to Code Section, 42-376, which applies to the timing of fertilizer applications, the following restrictions apply.

1. No applicator shall apply fertilizers containing nitrogen and/or phosphorus to turf and/or landscape plants during the prohibited application period or to saturated soils. No fertilizer containing nitrogen or phosphorus shall be applied between June 1 and September 30 as well as any other prohibited application period.

2. Fertilizer containing nitrogen and/or phosphorus shall not be applied before seeding or sodding a site and shall not be applied for the first 30 days after seeding or sodding, except when hydro-seeding for temporary or permanent erosion control in an emergency situation (wildfire, etc.), or in accordance with the stormwater pollution prevent plan for that site.

In 2019, the Town passed a law banning the distribution of plastic straws. Plastic straws are detrimental to the environment as they do not fully degrade; overburden landfills; introduce unsafe chemicals into the environment; become litter and create hazards for land and aquatic animals due to ingestion; and create impediments to waste reduction and recycling goals.

Code Section 42-601 states that single-use plastic straws or stirrers shall not be used, sold, distributed in any commercial establishment located within the corporate limits of the Town of

Palm Beach, at any town facility or town property or by any special event permittee. Additionally, Town contractors and special event permittees cannot sell, use, provide beverages with, or offer the use of single-use plastic beverage straws or single-use plastic stirrers in Town facilities or on Town property.

With regard to water conservation, the Town adopted Chapter 66, Natural Resource Protection that applies to all new construction and substantial improvements. The regulations establish the nine (9) principles of Florida friendly landscaping. Those guiding principles are as follows.

1. Right plant.
2. Right place.
3. Water Efficiently.
4. Fertilize appropriately.
5. Mulch.
6. Attract wildlife.
7. Manage yard pests responsibly.
8. Recycle.
9. Reduce stormwater runoff.
10. Protect the waterfront.

Section 66-286 provides specific regulations pertaining to irrigation standards and encouraging the use of drought tolerant grasses.

As explained in the Recreation and Open Space Element, the Town of Palm Beach is currently pursuing the Florida Clean Marina Program designation. The Clean Marina Program designation is administered through the Florida Department of Environmental Protection. The goal of the designation program is a proactive approach to environmental stewardship. Participants receive assistance in implementing Best Management Practices through on-site and distance technical assistance, mentoring by other Clean Marinas and continuing education. To become designated as a Clean Marina, facilities must implement a set of environmental Best Management Practices (BMPs) designed to protect Florida's waterways. These BMPs address critical environmental issues such as sensitive habitats, waste management, storm water control, spill prevention and emergency preparedness. Designated facilities and those facilities seeking designation receive ongoing technical support from the Florida Clean Marina Program and the Clean Boating Partnership.

The Town began requiring a percentage of plant material to be native in 2018 and most recently updated the plant list in 2023. Code Section 66-285 stipulates that for new development and redevelopment projects which modify 50 percent or more of the existing landscape/greenspace, the following regulations are required:

(a) Tree category - at least 30 percent of all trees shall be native trees, as listed on either the Institute for Regional Conservation's (IRC) Natives for Your Neighborhood Florida Statewide Plant List or the Florida Native Plant Society's Native Plants for Your Area list. The tree category percentage is calculated on the number of trees.

(b) Shrub and vine category - at least 30 percent of all shrubs and vines shall be native shrubs and vines as listed on either the Institute for Regional Conservation's (IRC) Natives for Your Neighborhood Florida Statewide Plant List or the Florida Native Plant Society's Native Plants for Your Area list. The shrub and vine category percentage is calculated on the number of shrubs and vines.

(c) Groundcover category - at least 30 percent of the groundcover area shall be native groundcover, as listed on either the Institute for Regional Conservation's (IRC) Natives for Your Neighborhood Florida Statewide Plant List or the Florida Native Plant Society's Native Plants for Your Area list. The groundcover category percentage is calculated based on the area.

Additionally, all site plans for new development and redevelopment which modify 50 percent or more of the existing landscape/greenspace shall be required to submit a landscape plan and irrigation plan to the architectural commission, or landmarks commission, as applicable. The Code requires a minimum landscape open space and maximum lot coverage per zoning district.

~~PATH FORWARD~~ SUMMARY

It is recommended that the Town continue to enforce the regulations pertaining to conservation and protection of natural resources and wildlife. Further, the Conservation Element provides an inventory of ecological communities that were inventoried in 1996. As almost 30 years have passed, a policy is proposed to update the inventory and continue to monitor in order to ensure the continued success of the Town's natural resources and wildlife. The Town should continue to enforce best management practices related to lawn maintenance and native landscaping. Additionally, the Town should maintain consistency with the 2023 Palm Beach Strategic Plan, which consists of six (6) focus areas, one of which speaks to conservation and environmental protection. ~~**The following Strategic Focus Area is recommended to be added as an Objective to the Conservation Element Goals, Objectives, and Policies.**~~

~~SFA:~~ ***~~Proactive Management of Environmental Threats | The Town creates resilience to environmental (natural and man-made) threats by identifying and planning for immediate and future threats such as climate change impacts, pollution from pesticides and chemicals, invasive species, sewage/stormwater/garbage impacts, and intrusive new technologies.~~***

~~Promote sustainable management and enhancement of the Town of Palm Beach's outstanding parks and natural environment through conservation and environmental protection.~~