

CONSERVATION ELEMENT SUPPORT DOCUMENT

I. INTRODUCTION

A. Purpose

The purpose of the Conservation Element of the City of Pembroke Pines (CE) is to provide a guide for the conservation, use, and protection of natural resources within the City and immediately adjacent property. The Support Document which includes the data and analysis requirements section first identifies the significant resources occurring within the community and the impacts occurring on those resources. The Adoption Document which includes the Goals, Objectives, and Policies section follows the Support Document which will help to insure commitment to long-term programs. The adopted goal of this element will help the City to continue to conserve all of its natural resources and thereby provide a high quality of life for current and future residents of the City of Pembroke Pines. All of the objectives of the CE are followed by an evaluation measure.

The majority of the revisions to the Conservation Element consist of updates to both the Data and Analysis Requirements, and the Goals, Objectives, and Policies sections that reflect actual conditions and continuations in policies over the next planning horizons pursuant to the recommendations included in the City's recently adopted Evaluation and Appraisal Report (EAR), February 2006. In addition, the element contains several policies which were part of the Academic Village Amendment (DCA Reference No. 99-1) which was adopted by the City Commission on August 18, 1999, by Ordinance No. 1309. The adopted additions to this element primarily consist of policies that provide for the preservation of vegetative communities, and for the submittal and adoption of the Ten Year Water Supply Plan eighteen months after the adoption of the regional water supply plan, in accordance with State Statutes, and the adopted EAR.

SFWMD updated the Lower East Coast Regional Water in November 2018; therefore the City is required to adopt the updates by May 2020; however, due to ovid-19, the City's work plan was delayed. The updates for 2020 include text amendments to the Future Land Use, Infrastructure and Conservationn Elements as well as the City's 10 Year water supply facilities work plan. The majority of changes were related to updating the planning horizons. The City is updating the Future Land Use, Conservation, and Infrastructure adoption elements along with the updated WSFWP. The WSFWP will be incorporated within the Infrastructure adoption element as well as the support element. No alternative water supply improvements were necessary as the adopted level of service will be maintained through the year 2040.

The City is proposing to modify Objective IV and add policies 4.24 through 4.26 providing for the preservation and protection of the city's Bald Eagle active Bald Eagle nest. Tables CE-1 and 2 have also been updated.

On December 5th, 2017, the Broward County Commission passed Resolution No. 2017-558, designating the Buzzard's Roost Archeological Site as a historic resource. The site is identified on the City's Archeological map of the Conservation Element (CE-2) as BD92. As a result of this designation, the City is proposing to amend Policy 4.17 as follows:

Policy 4.17 - New archeological sites obtained from the Florida Master Site File Inventory were added to the City's natural resources map series (Map No. CE-2, CE – Appendix – Maps – Page 1) and will be updated on an as needed basis. The City hereby designates the Buzzards Roost Archeological site a historic resource which has a Florida Master Site File Number 8BD92, consistent with the Broward County designation pursuant to Resolution No. 2017-558, adopted December 5, 2017.

The above language has been reviewed with no objection by the county's Historic Preservation Officer, Rick Ferrer. In addition, the county does not require the City to take any action on Map No. CE-2.

Planning Horizons – The CE planning horizons are 2020 and 2030.

Service Area – The CE service area consists of the entire City of Pembroke Pines.

B. Physiography

The City of Pembroke Pines is situated in the southwestern portion of Broward County, which is the second largest county based upon population within the State of Florida. The County consists of approximately 1,200 square miles; however, only the eastern third (414 square miles) is considered within the planning or development area. Of these 414 square miles, the City of Pembroke Pines consists of approximately 34 square miles or approximately 9% of the entire County. The western part of the County (where Pembroke Pines is situated) is nearly level, generally a treeless plain that appears to be flat. The soils are organic and situated over a limestone base. In many places the soils are shallow; however, there are pockets of muck occurring throughout the western reaches of Pembroke Pines.

Prior to the diking of the Everglades, this area contained standing water for months at a time. However, since the draining of this area, the soils are fairly well drained organic soils subject to oxidation and subsidence. Occasionally, wild fires occur which burn off more of the organic soil, thereby decreasing the thickness of the material. Since the draining of this area, there has also been an invasion of exotic trees such as Melaleuca, Australian Pine and Brazilian Pepper in the western reaches of the City. CE Policy 4.13 provides for the City to reduce the spread of these exotic plants through the year 2015. Policy 4.19 is adopted to further efforts to reduce invasive exotic species and maximize native plants in the City. Agriculture is very limited in the western part of Pembroke Pines and typically is accessory to principal residential uses. Cattle ranching activities that existed in the eastern and western portions of the City have ceased completely in the eastern portion and have been significantly limited in the western portion.

II. DATA AND ANALYSIS REQUIREMENTS

A. Water Resources

1. Surface Water

The Pembroke Pines area is generally drained by the Snake Creek Canal (C-9) which is located on the southern boundary of Broward County. This canal also serves the northern part of Dade County and the City of Miramar. A series of lateral canals connect another portion of Pembroke Pines to the South New River Canal which runs parallel with Griffin Road. Existing drainage in the urbanized City is adequate. As development continues in the western reaches of the City, each development will be required to meet drainage improvement requirements in accordance with the standards of the South Broward Drainage District, Central Broward Water Control District, South Florida Water Management District, Broward County Water Management Division, and the City of Pembroke Pines. Approximately 20% of the land must be provided as water bodies to maintain an adequate drainage system to insure the hydraulic integrity of the entire basin. Retaining a high percentage of property for water bodies will continue to be an essential component of the site plan review process as it allows for greater creativity in the layout of new developments. Water bodies in excess of 20% of the land area are also encouraged to further enhance planning and design opportunities.

As noted earlier, Pembroke Pines lies within the jurisdiction of the South Florida Water Management District (as does most of South Florida). The District is responsible for water conservation, flood control and drainage requirements for all developments within its jurisdiction. Additionally, the Broward County Water Management Division reviews plats as they are processed through Broward County to insure that drainage systems meet the immediate guidelines and requirements of the countywide concern. This will insure that during wet periods there will be adequate drainage so as not to over burden the master drainage system for the county and still protect public and private property.

CE Policies 2.6, 4.8, 4.11, 4.12, 4.13, 4.15, 4.16 and 4.17, and FLU Policies 3.5 and 3.6, provide strategies for the City to protect and maintain wetlands, natural reservations, and surface water quality, and in so doing, maintain the integrity of the master drainage system. CE Policies 2.6, 4.8, 4.11, 4.12, 4.13, 4.15, and 4.16 were adopted pursuant to the Academic Village Amendment (DCA Reference No. 99-1) which was adopted by the City Commission on August 18, 1999, by Ordinance No. 1309. The primary purpose of the adopted policies and updated objectives associated with the Academic Village Amendment is to maintain and protect natural reservations and wetlands, and to link them with other recreational and transportation facilities such as parks and bikeways for their efficient use.

CE Policies 2.6, 4.8, 4.11, 4.13, and 4.15 reflect actual conditions by recognizing other governmental agencies with primary roles in the protection and maintenance of surface water resources. CE Policy 4.17 was revised to provide for updates to the City's natural resources map series on an as needed basis pursuant to the recommendation of the EAR adopted February 2006, and in accordance with the Broward County map series prepared for the Broward County Department of Urban Planning and Redevelopment (FKA Broward County Department of Planning and Environmental Protection, and Broward County Department of Natural Resource Protection). Map No. FLU-5 - City of Pembroke Pines Natural Resources identifies lakes, water bodies, surface waters, and soils pursuant to FLU Policies 3.4 and 11.9, and CE Policy 4.15 (see FLU - Appendix - Maps - 6).

2. Flood Plains

The Federal Flood Insurance Administration map for Pembroke Pines, which is prepared pursuant to the National Flood Insurance Program, identifies areas within the City that are subject to flooding for both the 100-year and 500-year periods. The 100-year flood zone area is generally everything west of University Drive, while the 500-year zone is the balance of the City east of University Drive. Pembroke Pines, through the Environmental Services Division, participates in the National Flood Insurance Program of the Federal Emergency Management Agency. It is required that all new development meet the guidelines of the National Flood Insurance Program to insure the protection of the residents of the development as well as their property from potentially hazardous flooding conditions. In addition, the Pembroke Pines Emergency Preparedness Plan, which is administered by the Pembroke Pines Fire Department, establishes a procedure for evacuation and rescue in the event of an emergency such as a hurricane. Infrastructure Element (IE) Policy 5.3 addresses the criteria that continue to be used by the various governmental agencies to protect property from potentially hazardous flooding conditions. CE Policy 2.14 and FLU Policies 13.1 and 13.3 provide for the City to continue to implement land development regulations to protect property from flood damage.

3. Ground Water

The sub-surface strata can be grouped into three general categories: (1) The Biscayne Aquifer, (2) The Floridian Aquiclude, and (3) The Floridian Aquifer. The Biscayne Aquifer is the unit closest to the surface and is composed primarily of Palmico Sands, Miami Oolite, Anastasia Formation and Fort Thompson Formation. The Floridian Aquiclude primarily consists of impermeable strata which prohibit the intermingling of water between the Biscayne Aquifer and the Floridian Aquifer which is beneath the aquiclude. The upper zone of the Floridian Aquifer extends about 900 ft. to 1,900 ft. below sea level and consists of a series of limestone strata including Tampa (Miocene), Suwanne (Oligocene), Ocala (Eocene), Avon Park and Lake City Limestones. The lower zone of the Floridian Aquifer extends for 1,900 ft. to what is known as the "Boulder Zone."

The Biscayne Aquifer is one of the most productive water producing aquifers in the world. It has been designated the only reliable source of drinking water for all of Broward County. In addition, since 1979, it has been designated as the sole source of drinking water by the U.S. Environmental Protection Agency. Despite its high productivity and continuous ability to supply water for drinking, growth in the water use areas has placed the aquifer under stress in recent years. The aquifers are highly permeable, and recharge depends on local rainfall and water released from Lake Okeechobee through the network of canals. When water demands are increased, so is the threat of saltwater intrusion from the Atlantic Ocean during drought conditions.

During the EAR sufficiency review conducted by the South Florida Regional Planning Council (SFRPC) in 1995, a recommendation was made to add a discussion and data regarding the effects of saltwater intrusion on groundwater resources, wellfield capacities, and levels of service. In addition, the SFRPC indicated the EAR did not contain an assessment and evaluation of whether the wellfield protection ordinance adequately provides and maintains the level of service standards, or the status of water quality in the City's wellfields. IE Policy 10.5 and CE Policy 2.13 have been updated to address the SFRPC's recommendations by providing for the data to be included with the Ten Year Water Supply Plan as recommended by the 2006 adopted EAR). This assessment is included in the adopted Ten Year Water Supply Work Plan.

CE Policy 2.12 was updated and provides for all of the objectives and policies that call for the coordination among the various governmental agencies in the provision of water quality protection and aquifer recharge to be incorporated in the City's Intergovernmental Coordination Element during the amendment cycle following the update. Table ICE-4 of the adopted Intergovernmental Coordination Element will also be updated pursuant to CE Policy 2.12.

In order to combat contamination by toxic substances and saltwater intrusion, Broward County prepared a study of Water Supply and the Selection of Future Wellfield Sites in Broward County in 1986. The study recommended moving wellfields away from coastal areas, which are in danger of saltwater intrusion, to centralized wellfields in the north and south portions of the county. The County has since developed a south regional wellfield at Brian Piccolo Park; however, there are no well sites planned within the corporate limits of the City of Pembroke Pines. As stated above, the City will continue to play a coordinating role in the protection and conservation of groundwater resources. CE Policies 2.7, 2.9, 2.10 and 2.11, FLU Policies 10.1, 10.2, 10.3 and 10.4, and IE Policies 2.11 through 2.12 were adopted pursuant to the recommendations of the 1995 EAR as strategies to further protect and utilize the quantity and quality of water resources within the community. CE Policy 2.8 and IE Policy 2.10 have been revised to reflect the completion of the inventory of septic tank locations within the city. In addition, Policies 2.15 and 2.16 were adopted pursuant to State Statutes and as recommended by the adopted EAR to further the city's efforts to increase the coordination between land use and future water supply planning, and to protect and preserve the Biscayne Aquifer.

B. Flora and Fauna

As noted earlier, the City of Pembroke Pines has extremely flat topography with very little native flora occurring within the community. Where existing small cypress stands or native plants are occurring, every effort continues to be made to preserve these areas. Also, if cypress were involved, the SFWMD, the Florida Department of Environmental Protection, and the United States Army Corps of Engineers would have review responsibilities for this type of plant community. As part of site design, native plants are encouraged to the greatest extent possible to help develop a canopy as the City matures.

The following provides a generalized list of the endangered species of plants and animals (flora and fauna) in the county. . Policies 4.19, 4.20, 4.21 and 4.22 further the City's efforts to preserve native vegetation areas, restore and protect the ecological values and functions of the Everglades Ecosystem, and conserve water. In 2007, the City's first active Bald Eagle nest was identified and Proposed Policies 4.24 through 4.26 have been added to protect and preserve the nest as well as provide the foundation for the adoption of an eagle sanctuary protection ordinance.

Table CE-1
Endangered and Threatened Plants and Animals
City of Pembroke Pines
2005

Scientific Name	Common Name	Designated Status		
		FGFWFC	FDA	USFWS
Plants				
<i>Acrosichum aureum</i>	Gold leather fern		E	
<i>Acrostichum danaeifolium</i>	Giant leather fern		T	
<i>Anemia adiantifolia</i>	Pine fern		T	
<i>Asclepias curtissii</i>	Curtiss' milkweed		T	
<i>Asplenium abscissum</i>	Spleenwort (unnamed)		T	
<i>Asplenium serratum</i>	Bird's nest spleenwort; wild birdnest fern		E	
<i>Asplenium trichomanes-dentatum</i>	Spleenwort (unnamed)		T	
<i>Bletia purpurea</i>	Pine pink		T	
<i>Campyloneurum phyllitidis</i>	Strap fern (unnamed)		T	
<i>Catopsis floribunda</i>	Air plant (unnamed)		E	
<i>Chrysophyllum olivaeforme</i>	Satinleaf		E	
<i>Coccothrinax argentata</i>	Silver palm		C	
<i>Cocos nucifera</i>	Coconut palm		T	
<i>Ctenitis sloanei</i>	Comb fern (unnamed)		T	
<i>Ctenitis submarginalis</i>	Comb fern (unnamed)		T	
<i>Encyclia cochleata</i>	Shell orchid; clamshell orchid		T	
<i>Encyclia tampensis</i>	Butterfly orchid		T	
<i>Epidendrum difforme</i>	Unbelled epidendrum		T	
<i>Epidendrum nocturnum</i>	Night-scent orchid; night-smelling epidendrum		T	
<i>Epidendrum rigidum</i>	Rigid epidendrum		T	
<i>Ernodia littoralis</i>	Beach creeper		T	
<i>Eulophia alta</i>	Wild coco; ground coco		T	
<i>Habenaria odontopetala</i>	Rein orchid (unnamed)		T	
<i>Monotropa brittonii</i>	Scrub Indian pipes; Britton's pinesap		UR2	
<i>Myrcianthes fragrans</i> var. <i>simpsonii</i>	Simpson's stopper; twinberry		UR2	
<i>Nephrolepis biserrata</i>	Boston fern (unnamed)		T	
<i>Okenia hyopgaea</i>	Burrowing four-o'clock		E	
<i>Ophioglossum palamatum</i>	Hand adder's tongue	E		UR2

	fern		
<i>Osmunda regalis</i>	Royal fern		C
<i>Peperomia floridana</i>	Everglades peperomia	E	UR2
<i>Phlebodium aureum</i>	Golden polypody		T
<i>Pleopeltis revoluta</i>	Star-scale fern	T	
<i>Polypodium ptilodon</i>	Polypody fern (unnamed)		T
<i>Psilotum nudum</i>	Whisk fern; fork fern		T
<i>Pteris longifolia</i>	Ladder brake fern	T	
<i>Pteris tripartita</i>	Giant brake fern		T
<i>Pteris vittata</i>	Brake fern (unnamed)	T	
<i>Remirea maritima</i>	Beach star		E
<i>Sabal etonia</i>	Scrub palmetto		T
<i>Scaevola plumieri</i>	Inkberry		T
<i>Selaginella arenicola</i>	Sand spikemoss		T
<i>Suriana maritima</i>	Bay cedar		E
<i>Tectaria heracleifolia</i>	Halberd fern (unnamed)		T
<i>Tectaria incisa</i>	Halberd fern (unnamed)		T
<i>Thelypteris dentata</i>	Downy shield fern		T
<i>Thelypteris interrupta</i>	Aspidium fern (unnamed)		T
<i>Thelypteris kunthii</i>	Aspidium fern (unnamed)		T
<i>Thelypteris ovata</i>	Aspidium fern (unnamed)		T
<i>Thelypteris palustris</i>	Marsh fern		T
<i>Thelypteris reptans</i>	Creeping fern		T
<i>Tillandsia balbisiana</i>	Wild pine; air plant (unnamed)		T
<i>Tillandsia circinata</i>	Wild pine; air plant (unnamed)		T
<i>Tillandsia fasciculata</i>	Common wild pine		C
<i>Tillandsia flexuosa</i>	Twisted air plant		T
<i>Tillandsia paucifolia</i>	Wild pine; air plant (unnamed)		T
<i>Tillandsia polystachia</i>	Wild pine; air plant (unnamed)		T
<i>Tillandsia setacea</i>	Wild pine; air plant (unnamed)		T
<i>Tillandsia utriculata</i>	Giant wild pine; giant air plant		C
<i>Tillandsia valenzuelana</i>	Wild pine; air plant (unnamed)		T
<i>Trismeria trifoliata</i>	Bracken fern (unnamed)		T
<i>Vittaria lineata</i>	Shoestring fern		T
<i>Zamia integrifolia</i>	Florida arrowroot		C UR5
Animals			
<i>Chenille mydas mydas</i>	Atlantic Green Turtle	E	E

Eretmochelys imbricata imbricata	Atlantic Hawksbill Turtle	E	E
Caretta caretta caretta	Atlantic Loggerhead Turtle	T	T
Dermochelys coriacea	Leatherback Turtle	E	E
Gopherus polyphemus	Gopher Tortoise	SSC	UR2
Alligator mississippiensis	American alligator	SSC	T(S/A)
Trichechus manatus latirostris	West Indian Manatee	E	T
Rana areolata	Florida gopher frog	SSC	UR2
Crocodylus acutus	American crocodile	E	E
Drymarchon corais couperi	Eastern Indigo snake	T	T
Tantilla oolitica	Miami Black-headed snake	T	UR2
Falco peregrinus	Peregrine Falcon	E	E
Pelecania occidentalis carolinensis	Eastern Brown Pelican	T	E
Pandion halieotus	Osprey	SSC	
Falco sparverius paulus	Southeastern American kestrel	T	UR2
Haenatopus palliatus	American oyster catcher	SSC	
Sterna antillarum	Least tern	T	
Aphelocoma coerulescens coerulescens	Florida Scrub jay	T	UR2

Plant list was updated by the Broward County Parks and Recreation Division in 1988.

Animal list was updated by the Broward County Cooperative Extension.

- FWC - Florida Fish and Wildlife Conservation Commission
- FDA - Florida Department of Agriculture
- USFWS - U.S. Fish and Wildlife Service
- C - Commercially exploited
- E - Endangered
- T - Threatened
- T(S/A) - Threatened Due to Similarity of Appearance
- SSC - Species of Special Concern
- UR1 - Under review for federal listing, with substantial evidence in existence indicating at least some degree of biological vulnerability and/or threat.
- UR2 - Under review for listing, but substantial evidence of biological vulnerability and/or threat is lacking.

Sources: Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida, Florida Game and Fresh Water Fish Commission, 1987.
Florida Cooperative Extension Service. Broward County Conservation Element, 2005.

The vast diversity of plant habitats found in South Florida provide either temporary or permanent homes for over 250 species of birds. More than 200 species of birds have been sighted in the Broward County Regional Parks. Hardwood hammocks, cypress wetlands and pine flatwoods are among the habitats preserved in the parks for human recreation and wildlife habitat.

Following is a list of birds which have been sighted in Broward County regional parks. The specific parks in which sightings have taken place are noted.

Park abbreviations are as follows:

- M - Markham
- E - Easterlin
- T - Tradewinds
- S - Secret Woods
- TT - Tree Tops
- F - Fern Forest
- W - West Lake
- Q - Quiet Waters
- D - Deerfield Island
- H - Heritage

The abundance notations are in accordance with "Checklist of Southern Florida Birds" compiled by Dr. Ira Joel Abramson and Dr. Oscar T. Owre for the Tropical Audubon Society. The abundance symbols are:

- C - common; often seen or heard in appropriate habitat.
- U - uncommon; usually present, but not always heard or seen.
- R - rare; present in appropriate habitats only small numbers, and seldom seen or heard.
- r - resident; present all year, although abundance may vary seasonally.
- s - summer visitor (includes spring and fall).
- w - winter visitor (includes spring and fall).
- m - migrant; present ordinarily only in migration.
- o - occasional or casual visitor.

Source: Interpretive Section of the Broward County Parks and Recreation Division.

Bird	Abd.	Parks
Common Loon	Uw	W, H
Pied-billed Grebe	Cw	M,E,T,TT,W,Q,H
Brown Pelican	Cr	W, D
Double-crested Cormorant	Cr	M,T,W,Q,D,H
American Anhinga	Cr	M,E,T,S,TT,W,Q,H
Magnificent Frigatebird	Cr	W
Great Blue Heron (Great White)	Cr	W, H
Great Blue Heron	Cr	M,E,T,S,TT,W,Q,D,H
Green-backed Heron	Cr	M,E,T,S,TT,F,W,Q,H
Little Blue Heron	Cr	M,E,T,S,TT,W,Q,D,H
Cattle Egret	Cr	M,E,T,S,TT,F,W,Q,H
Reddish Egret	Ur	W
Great Egret	Cr	M,E,T,TT,F,W,Q,D,H
Snowy Egret	Cr	M,E,S,TT,W,H
Tri-color Heron	Cr	M,E,T,S,TT,W,Q,D,H
Black-crowned Night Heron	Ur	M,W,H
Yellow-crowned Night Heron	Cr	E,S,W,D,H
Least Bittern	Ur	M,H
American Bittern	Ur	M,H
Wood Stork	Cr	M,T,TT,W
Glossy Ibis	Cr	M,H
White Ibis	Cr	M,T,W,D,H
Scarlet Ibis	Rr	W
Roseate Spoonbill	Cr	W
Fulvous Whistling Duck	Cr	W
Mottled Duck	Cr	M,H
Blue-winged Teal	Cw	M,E,W
American Wigeon	Cw	M
Northern Shoveler	Cw	M
Ring-necked Duck	Cw	M,E,W,Q
Lesser Scaup	Cw	M,W,H
Ruddy Duck	Uw	M
Red-breasted Merganser	Cw	S,W
Turkey Vulture	Cr	All
Black Vulture	Cr	M,S,TT,F,H
Snail Kite	Rr	M
Sharp-shinned Hawk	Uw	All
Cooper's Hawk	Uw	M,H
Red-tailed Hawk	Ur	M,E,T,S,TT,F,W,H
Red-shouldered Hawk	Cr	M,E,T,S,TT,F,W,Q,H
Broad-winged Hawk	Cm	M,E,S,TT,W,Q,H
Bald Eagle	Ur	T
Northern Harrier	Cw	M,T,H
Osprey	Cr	E,S,F,W,Q,D,H

Peregrine Falcon	Uw	E,W
Merlin	Uw	M,E,S,TT,W,Q,H
American Kestrel	Cw	All
Common Bobwhite	Cr	M,T,S,TT,F,H
Sandhill Crane	Ur	H and Chapel Trail Preserve
Limpkin	Cr	M,H
King Rail	Cr	M
Clapper Rail	Ur	W
Sora	Cw	M
Purple Gallinule	Cr	M
Common Moorhen	Cr	M,E,T,S,TT,F,W,Q,H
American Coot	Cw	M,E,T,F,W,Q,H
American Oystercatcher	Rw	W
Semipalmated Plover	Cw	W
Piping Plover	Uw	W
Wilson's Plover	Ur	W
Killdeer	Ur	M,E,T,S,F,W,H
Black-bellied Plover	Cw	W
Common Snipe	Cw	M,H
Whimbrel	Rm	W
Spotted Sandpiper	Cw	M,E,T,S,W,Q,D,H
Solitary Sandpiper	Um	M,E,W
Willet	Cr	W
Ruddy Turnstone	Cw	W
Greater Yellowlegs	Cw	E,W,H
Lesser Yellowlegs	Cw	E,W,H
Red Knot	Uw	W
Pectoral Sandpiper	Um	M,H
White-rumped Sandpiper	Um	W
Least Sandpiper	Cw	M,E,W
Dunlin	Cw	W
Short-billed Dowitcher	Cw	W
Stilt Sandpiper	Um	W
Semipalmated Sandpiper	Cw	W
Western Sandpiper	Cw	W
Sanderling	Cw	W
Black-necked Stilt	Cs	M,E,T,W,H
Greater Black-backed Gull	Uw	W
Herring Gull	Dw	W,D,H
Ring-billed Gull	Cw	E,S,W,D,H
Laughing Gull	Cr	E,S,W,D,H
Bonaparte's Gull	Uw	W
Gull-billed Tern	Ur	M,W
Forster's Tern	Cw	M,E,W
Common Tern	Uw	W

Little Tern	Cs	E,F,W,D,H
Royal Tern	Cr	S,F,W,D
Sandwich Tern	Cr	W
Caspian Tern	Uw	M,W,H
Black Tern	Cm	M,W,H
Black Skimmer	Cr	E,W,Q,H
Rock Dove	Cr	M,E,T,S,TT,F,Q,H
White-winged Dove	Rr	TT,H
Mourning Dove	Cr	All
Ground Dove	Cr	M,E,W,H
Canary-winged Parakeet	Cr	S,H
Red-fronted Amazon	Rr	E
Yellow-billed Cuckoo	Cs	All
Black-billed Cuckoo	Um	E
Smooth-billed Ani	Cr	M,E,T,S,TT,F,W,Q,H
Barn Owl	Cw	M,TT,F,H
Common Screech Owl	Cr	M,E,T,S,TT,F, H
Great Horned Owl	Ur	T,F,Q,D
Burrowing Owl	Ur	M,H
Chuck-will's-widow	Cr	M,E,T,S,TT,F,H
Whip-poor-will	Cw	E
Common Nighthawk	Cs	All
Chimney Swift	Rm	E,H
Ruby-throated Hummingbird	Uw	E,T,S,TT,F,H
Belted Kingfisher	Cw	All
Common Flicker	Cr	M,E,T,S,TT,F,W,Q,H
Pileated Woodpecker	Ur	E,T,S,TT,F,W,D,H
Red-bellied Woodpecker	Cr	All
Yellow-bellied Sapsucker	Cw	All
Downy Woodpecker	Ur	M,E,T,S,TT,F,W,H
Eastern Kingbird	Cm	M,E,T,S,W,H
Gray Kingbird	Cs	S,W
Western Kingbird	Uw	E
Eastern Phoebe	Cw	M,E,H
Great Crested Flycatcher	Cr	E,S,D,H
Eastern Pewee	Um	M,E,T,S,TT,F,H
Tree Swallow	Cw	All
Bank Swallow	Um	M
Rough-winged Swallow	Cw	All
Barn Swallow	Cm	All
Cliff Swallow	Um	M
Purple Martin	Cm	M,E,T,S,TT,F,Q,H
Blue Jay	Cr	M,E,T,S,TT,F,D,H
Fish Crow	Cr	All
House Wren	Cw	M,E,T,S,TT,F,W,Q,H

Carolina Wren	Cr	M,E,T,S,TT,F,H
Northern Mockingbird	Cr	All
Gray Catbird	Cw	All
Brown Thrasher	Ur	M,E,T,S,TT,F,W,H
American Robin	Cw	M,E,T,S,TT,F,W,Q,H
Wood Thrush	Rm	E
Hermit Thrush	Uw	M,E,F
Swainson's Thrush	Um	E,S,F
Gray-checked Thrush	Rm	E,T,S,TT
Veery	Um	M,E,T,S,TT,F
Blue-gray Gnatcatcher	Cw	All
Ruby-crowned Kinglet	Uw	M,E,T,S,TT,F
Cedar Waxwing	Cw	All
Loggerhead Shrike	Cr	M,T,H
European Starling	Cr	E,T,S,TT,F,H
White-eyed Vireo	Cr	M,E,T,S,TT,F,W,Q,H
Yellow-throated Vireo	Cm	M,E,T,S,TT,F
Solitary Vireo	Cm	M,E,T,S,TT,F,H
Black-whiskered vireo	Cs	E,TT,W,H
Red-eyed Vireo	Um	M,E,T,S,TT,F,W,H
Black-and-White Warbler	Cw	All
Prothonotary Warbler	Um	M,E,S
Swainson's Warbler	Rm	E
Worm-eating Warbler	Um	M,E,T,S,TT,F,W,H
Tennessee Warbler	Rm	E,S,H
Orange-crowned Warbler	Uw	M,E,T,S,TT,F,H
Nashville Warbler	Rm	E
Northern Parula Warbler	Cw	All
Yellow Warbler	Ur	E,F,W,H
Magnolia Warbler	Um	E,H
Cape May Warbler	Cm	All
Black-throated Blue Warbler	Cm	All
Yellow-rumped Warbler	Cw	All
Black-throated Green Warbler	Um	E,S,TT
Blackburnian Warbler	Rm	E,S,H
Yellow-throated Warbler	Ur	E,S,H
Chestnut-sided Warbler	Um	E,S
Bay-breasted Warbler	Um	E
Blackpoll Warbler	Cm	All
Pine Warbler	Ur	M
Prairie Warbler	Cw	All
Palm Warbler	Cw	All
Ovenbird	Cw	All
Northern Waterthrush	Uw	All
Louisiana Waterthrush	Rw	E

Kentucky Warbler	Um	E
Connecticut Warbler	Rm	M,E,H
Common Yellowthroat	Cr	All
Yellow-breasted Chat	Uw	E,S
Hooded Warbler	Uw	E,H
Wilson's Warbler	Um	E
Canada Warbler	Um	E
American Redstart	Cm	All
House Sparrow	Cr	All
Bobolink	Cm	M,E,H
Eastern Meadowlark	Cr	M,TT,H
Red-winged Blackbird	Cr	All
Spotted Oriole	Cr	E,T,S,H
Northern Oriole	Cw	E,S,H
Boat-tailed Grackle	Cr	M,E,T,S,T,D,H
Common Grackle	Cr	All
Brown-headed Cowbird	Uw	M,H
Stripe-headed Tanager	Ro	E
Western Tanager	Rm	E
Scarlet Tanager	Um	E,S
Summer Tanager	Ur	E,S,H
Northern Cardinal	Cr	All
Rose-breasted Grosbeak	Cm	E,S,H
Blue Grosbeak	Um	E
Indigo Bunting	Cw	E,T,S,TT,F,H
Painted Bunting	Cw	E,T,S,TT,F,H
American Goldfinch	Cw	All
Rufous-sided Towhee	Ur	M,E,T,H
Savannah Sparrow	Cw	M,E,F,H
Grasshopper Sparrow	Ur	M,F,H
Chipping Sparrow	Rw	M
Swamp Sparrow	Cr	M

C. Wetland Communities

Prior to the drainage of the Everglades, almost the entire City of Pembroke Pines was a sawgrass type community; however, with the construction of the major drainage canals in the early 1900's and the diking of the Everglades, the area has drained over the last 50 years and the occurrence of wetlands is limited. Isolated wetlands still occur and these are regulated primarily by the SFWMD, Florida Department of Environmental Protection and United States Army Corps of Engineers. Whenever a unique wetland site is discovered, every effort is made to preserve the site or to provide adequate mitigation to offset any negative impacts to these wetland plant communities. The City has completed construction of amenities associated with Florida's first wetlands bank known as the Chapel Trail Conservation District, located on the south side of Sheridan Street, between SW 196th and 208th Avenues, just east of US 27. The amenities include a boardwalk, picnic areas, and canoe riding facilities. FLU Policies 2.7, 2.9, 3.3, and 11.4, and ROS Policies 1.4, 2.3, and 3.4, were adopted pursuant to the recommendation of the 1995 EAR to promote and protect the Chapel Trail Preserve as a tourist attraction and valuable environmental resource. FLU Policy 3.4 has been updated to provide for the continued updates to the water bodies map upon updates to the County's map series. ROS Policy 1.5 states that the City shall provide new or enhanced public access to water bodies, as appropriate in accordance with Resolution No. 3127.

CE Policies 4.3, 4.4, and 4.7 reflect the City's coordinating role in the protection of wetland communities. CE Policy 4.18 was adopted to direct incompatible land uses away from wetlands in accordance with CE Table III below and the Broward County Code of Ordinances, Chapter 27, Article XI, Aquatic and Wetland Resource Protection.

TABLE CE-II

Compatibility of Land Uses Relative to the Wetland Benefit Index

Wetland Benefit Index	Land Use Compatibility
1. Wetlands with a Wetland Benefit Index (WBI) value greater than Or equal to 0.80.	1. There is a rebuttable presumption that all land uses except for conservation Uses are incompatible
2. Wetlands with a WBI value less than 0.8.	2. All land uses are compatible, provided that the wetland impact compensation requirements of Chapter 27, Article XI, is satisfied.

Source: Broward County Code of Ordinances, Chapter 27, Article XI, Aquatic and Wetland Resource Protection.

D. Air Quality

Due to the prevailing breezes occurring in southeastern Florida, the air quality is generally good for the Pembroke Pines area. The major impact to the community would be ozone emission from automobiles, as very little heavy industrial activities are presently occurring within the community. While the Comprehensive Plan provides for expansion of industrial opportunities for the community, these are anticipated to be of the light industrial/office park type developments which will have minimal impacts on the air quality. Additionally, the Broward County Environmental Protection Department is responsible for insuring to the United States Environmental Protection Agency (E.P.A.) that air quality standards are maintained. Broward County was redesignated to "attainment" on April 25th 1996, by the E.P.A. The air quality in the county is good 90 percent of the time and has not exceeded the EPA NAAQS (National Ambient Air Quality Standards) for over ten years. The County notes in their Conservation Element that meeting future air quality standards may present a challenge unless significant changes are made to the coordination of land development and transportation planning for air quality. The promotion of alternative modes of transportation and transit oriented development can play a part in meeting future air quality standards.

CE Objective I recognizes Broward County's primary role in the protection of air quality countywide. CE Policy 1.3 reflects the City's coordinating function in the facilitation of alternative modes of transportation facilities to improve air quality in accordance with the Transportation Element, recommendations of the 1995 EAR, and as required by Chapter 163, FS, and Rule 9J-5, FAC. FLU Objective XIV and supporting Policies 14.1 and 14.2 were adopted pursuant to the Broward County Planning Council's recommendations and further the City's efforts in the improvement of air quality.

E. Lakes, Soils & Minerals

All of the lakes occurring within the City are man-made and have been developed for providing fill for development or for providing commercially valuable minerals. The western reaches of Pembroke Pines had been known for many years for their valuable sand and rock materials which were utilized for road building and development activities throughout Broward County. Since the city is primarily built-out, mining activities and rock pits no longer exist.

At the present time, the City of Pembroke Pines is not experiencing any soil erosion problems. The office of the United States Soil Conservation Service is located in the Town of Davie, Florida, which is approximately five (5) miles from City Hall. Whenever soil erosion problems occur, or a situation arises which may indicate that soil erosion could potentially occur, the Soil Conservation Service office is contacted to provide proper planning to minimize any negative impact. The City, in its review of site plans, particularly for new lake excavations, insures that all sites are properly sloped and vegetated as soon as possible after construction. This applies to the slopes of all lakes in both residential and non-residential developments. FLU Policies 3.5 and 3.6 were adopted pursuant to the recommendations of the Broward County Planning Council and further the City's efforts in the protection and construction of surface waters.

F. Fisheries, Wildlife, Marine Habitat and Vegetative Communities

Immediately to the west of the city is the Everglades/Conservation Area which is abundant with wildlife, fisheries, and vegetative communities unique to south Florida. The City of Pembroke Pines supports all programs occurring within this preserve. Additionally, the City hopes to foster the development of unique wildlife, marine and vegetative habitats within the 450 - acre conservation area which has been dedicated by the Chapel Trail Development (See CE Policy 4.5). CE Policies 4.11, 4.12, and 4.14 were part of the Academic Village Amendment (DCA Reference No. 99-1) which was adopted by the City Commission on August 18, 1999, by Ordinance No. 1309, to further protect the City's vegetative communities and wildlife habitats. FLU Policy 11.3 was adopted pursuant to the Broward County Planning Council's recommendations and advances the City's efforts to protect those areas known to be reproduction, nesting and feeding areas for animals listed as endangered or threatened species of concern. CE Policies 4.19 through 4.22, and FLU Policies 11.11 and 11.12 enhance the city's efforts to protect its native vegetative communities.

G. Pollution Problems

There are no known pollution problems affecting existing natural resources in the City of Pembroke Pines. Hazardous wastes are controlled through the Broward County Environmental Protection Department, which implements the adopted hazardous materials and storage tank regulations. These regulations are applicable countywide and are also designed to help safeguard the overall water supply of the county. Urban storm runoff is regulated by the criteria of the South Florida Water Management District, Broward County Water Management Division, Broward County Environmental Protection Department, and the City of Pembroke Pines. CE Policy 2.7 was adopted as recommended by the 1995 EAR to further protect the City's natural resources from pollution. CE Policy 3.2 provides for the implementation of land development regulations which manage hazardous waste in order to protect natural resources.

H. Current and Projected Water Needs

As noted in the Potable Water Element, there exists adequate capacity for the present/projected water needs through the year 2040. Projected water needs for the next ten years is being submitted with the Ten Year Water Supply Facility work plan.

The City of Pembroke Pines continues to comply with and endorses all programs of the South Florida Water Management District pertaining to water conservation and protection (See CE Policies 2.2, 2.3, 2.4, and 2.5) which provide for the implementation of applicable land development regulations and the roles of Broward County and the State of Florida in the conservation of water resources. Additionally, the City continues to endorse and comply with the Broward County Wellfield Protection Ordinance (See CE Policy 2.1 and FLU Policy 10.1) which further protects water quality.

The current and projected water needs and sources based upon residential, commercial, industrial and other uses can be found in Table 2-4 of the Ten Year Water Supply Facility Work Plan which updates and replaces IE-2 of the Infrastructure Element appendix section through the year 2030. The Ten Year Water Supply Plan is required to be adopted within 18 months of the adoption of the regional water supply plan. Policies CE 2.15, 2.16, FLU 10.5, and IE 7.7 and 10.6 address the Ten Year Water Supply Plan requirements.

The 2002, 2004, and 2005 legislatures established a process for water supply planning, amending Chapters 163 and 373, F.S., to improve the coordination of water supply and land use planning. Senate Bills 360 and 444 strengthened the statutory linkage between the regional water supply plans prepared by the water management districts and local government comprehensive plans. The City of Pembroke Pines falls within the Lower East Coast Regional Water Supply Plan area and is required to ensure that adequate water supplies will be available to meet future demand, by developing a 10-year water supply facilities work plan (WSFWP). The WSFWP includes alternative water supplies, water reuse and conservation programs as required by State Statute, and are incorporated into the City's Comprehensive Plan through the Potable Water Supply and Water Resource Management Coordination sub-element of the Infrastructure Element. Amendments have been made to the goals, objectives, and policies and data and analysis sections of this element, along with Future Land Use, Infrastructure, Capital Improvements, and Intergovernmental Coordination Elements addressing water supply planning requirements. Cross-reference notations have been added for all applicable amendments to the elements' goals, objectives and policies sections.

Conservation Element changes include Proposed Policies CE 2.17 (cross reference IE Policy 10.7), CE 2.18 (cross reference FLU Policy 10.6, IE Policy 9.3, and ICE Policy 1.9), and CE 2.19 (cross reference Existing CIE Policy 2.5). The changes also include updates to CE Objective II, Evaluation Measure for Objective II, and CE Policy 2.15 (cross reference IE Policy 7.1 and CIE Policy 2.7). Existing CE Policies 2.1 through 2.6, 2.11, 2.13, 4.11, 4.16, 4.21, and 4.22 are consistent with water supply planning requirements. In response to DCA's Objection, Recommendation and Comment report dated August 6th, 2008, CE Policy 4.23 has been added. SFWMD updated the Lower East Coast Regional Water in November 2018; therefore the City is required to adopt the updates by May 2020; however, due to Covid-19, the City's work plan was delayed. The updates for 2020 include text amendments to the Future Land Use, Infrastructure and Conservation Elements as well as the City's 10 Year water supply facilities work plan. The majority of changes were related to updating the planning horizons. The City is updating the Future Land Use, Conservation, and Infrastructure adoption elements along with the updated WSFWP. The WSFWP will be incorporated within the Infrastructure adoption element as well as the support element. No alternative water supply improvements were necessary as the adopted level of service will be maintained through the year 2040.