

# **Comprehensive Plan**

## **CONSERVATION ELEMENT**

---

Prepared for  
**The City Deltona**

Prepared by  
**IVEY, HARRIS & WALLS, INC.**  
631 S. Orlando Avenue, Suite 200  
Winter Park, Florida 32789  
(407) 629-8880

# TABLE OF CONTENTS

<b>INTRODUCTION.....</b>	<b>4</b>
<b>EXISTING CONDITIONS.....</b>	<b>4</b>
Vegetation Classification Land Use Codes.....	9
Listed Species.....	12
Air Quality .....	17
Commercially Valuable Minerals .....	17
Commercial / Recreational Use of Natural Resources.....	17
Managed Natural Areas.....	18
<b>ANALYSIS OF NATURAL RESOURCES.....</b>	<b>18</b>
Air Quality Plan .....	18
Surface Water Quality .....	19
Surface Water Pollution .....	20
Wetlands Plan.....	20
Water Conservation.....	21
Soil Erosion Plan.....	22
Groundwater Pollution .....	22
Floodplain Analysis .....	23
Flora and Fauna Plan.....	24
Hazardous Waste Management Plan.....	25
<b>COMMUNITY VISION.....</b>	<b>25</b>
Water Recreation/Stretch Goal.....	25
Vision Workshop Results.....	25

## **TABLES**

Table 5-1 Listed Species

## **MAPS**

Map 5-1 Potential Environmental Resources

Map 5-2 Soil Identification

# INTRODUCTION

The Conservation Element provides the framework for the preservation, protection, and enhancement of the City's natural resources. The goals, objectives, and policies outlined in this Element are strongly intertwined with other elements in the Plan relating to land use, infrastructure, recreation and open space, and solid waste. The intent of this Element is to provide a basis for responsible decision making for the appropriate use of natural resources when confronted by growth and corresponding development, as well as the identification and preservation of ecologically valuable and irreplaceable resources.

The City of Deltona contains a host of quality natural resources. The need for protection and management of the City's natural resources will increase as urban growth continues. Therefore, this Element takes a practical and responsible approach towards natural resource protection, recognizing the important contribution, directly and indirectly, of these resources to the quality of life for Deltona residents and its visitors.

Detailed programs are needed for monitoring surface water quality, ecological communities, and aquifer recharge, as well as a comprehensive study of the City's wildlife species and populations, as proposed activities of this element.

## EXISTING CONDITIONS

### *Environmental Setting and Landforms*

As noted in other elements of the Comprehensive Plan, the City of Deltona is located in the northeastern region of Central Florida. The City is situated in southwest Volusia County, surrounded by urban and residential areas including Enterprise, DeBary, DeLand, Lake Helen, Osteen and Orange City. While much of Deltona is developed as a residential community, it is also interspersed with a few uplands and wetlands in their natural vegetative states. The undeveloped areas of Deltona include xeric uplands, sand pine communities, pine flatwoods, mixed forested hardwoods, and herbaceous and forested wetlands. Lakes are a dominant feature within the City.

### **Topography**

The majority of Deltona lies on the DeLand Ridge, a major physiographic feature that extends the length of the county in the western section. This is an area of high Karst ridges of older marine terraces. The surface has been historically altered by erosion and the collapse of solution caverns in the underlying limestone. Local relief is significant; this is an area with a large number of lakes and depressions. A few areas on the ridge are slightly more than 100 feet above sea level. The topography can be defined as Karst, a result of limestone being dissolved by water and thus an irregular land surface. Features of Karst include lake or surface runoff and the presence of sinkholes, springs and circular lakes. Surface Karst features are developed in Deltona because it is high in elevation and thus, has not been repeatedly modified by sea inundations (USGS Report 90-4069).

### **Climate**

Deltona lies in a region that overlaps a transitional zone between the subtropical climate characteristic of south Florida, and the more temperate climate typical of the southeastern states. The mean annual temperature of the area is about 72 F, with average daily summer maximums above 90 F and average daily winter minimums slightly below 50 F. The average annual rainfall for the Deltona area as read from the isopluvial (rainfall) maps prepared by the St. Johns River Water Management District (SJRWMD) 1990 publication, is estimated to be 53.0 inches.

### **Surface Water**

Four primary separate lake systems, or basins, have been identified according to the Deltona Watershed Study; these are the Lake McGarity System, the Lake Theresa System, Lake Gleason System and Providence System. The lakes within each system are intermittently connected by periods of high water, and generally flow southward. The Lake McGarity and Gleason systems flow into Lake Monroe, which is part of the St. Johns River. The Lake Theresa system is landlocked with no direct outlet. Several wetland habitats are present within the watershed including: forested, scrub-shrub (thicket swamp), emergent, aquatic bed and unconsolidated bottom, which includes open water (lakes and ponds).

### **Surface Water Quality**

In Volusia County, several agencies conduct studies with respect to water quality. Surface water quality information is attached as provided by Professional Engineering Consultants in appendix A, which details pollutants and quantities within specific waterbodies of Deltona. Unfortunately, the historical pattern of water quality monitoring has been scattered and of limited use in terms of coverage and trend assessment. According to the Deltona Watershed study, water quality issues within Deltona include septic tank failures, stormwater/the major runoff; and the capacity of the stormwater management system.

### **Groundwater Resources**

The City of Deltona relies entirely on the Volusian-Floridan aquifer for its water supply. The City presently draws upon this water source at a series of wellfields. The water quality of the ground water derived from the aquifer is satisfactory for potable use via chlorine treatment. The Volusian-Floridan aquifer, is a sole source aquifer that is recharged only by rainfall and confined mostly within Volusia County. The most notable groundwater recharge area in the County is the DeLand Ridge. The two primary users of water within Volusia County include urban/residential uses and agricultural uses.

Recharge of the aquifer occurs through local rainfall and distribution through the lake system. It has been estimated that of the approximately 53 inches of rainfall occurring annually, less than 20 inches of rainfall is available to supply local surface and ground waters. The remainder is lost due to evapotranspiration, runoff and other losses.

### **Drainage and Floodplain Hazards**

Flooding is a natural phenomenon in Florida, commonly occurring along streams, rivers, lakes, and coastal areas. Floodplains, the low-lying lands that are subject to inundation from flood waters, provide a variety of benefits, including water storage, filtration, erosion control, habitat, and recreation. Floodplains are delineated according to the estimated frequency of flooding. The 100-year floodplain, commonly delineated for regulatory purposes, defines an area that has a one percent chance of being inundated in any given year. In any given year, the drainage

network of Deltona must accommodate 40 to 60 inches of rainfall, at least half of which occurs during a 3 to 4-month period.

The 100 year floodplain necessitates special design considerations for new development. Floodplains are categorized by the frequency with which flood generating storm events occur. That part of the floodplain that is inundated on annual or semi-annual basis is referred to as the high frequency floodplain and usually coincides with the zone of wetland vegetation. The central portion of the City lies within Flood Zone A, areas of 100-Year flood, whose base flood elevations and flood hazard factors have not been determined. Parts of the City lie within Flood Zone X considered outside of the 100 year floodplain. Areas within the 100 year floodplain are shown on the Potential Environmental Resources Map 5-1.

### **Soil Conditions**

Soils play an important role in the analysis of existing conditions in an area. The type of soil present will dictate to some extent the type of vegetative community present. Natural drainage patterns can be determined through evaluation of soils present. Deltona has a variety of soils, which can be generally grouped into two major categories: soils of sand ridges and soils of the flatwoods. The following summary regarding these soil groups has been taken from the Natural Resources Conservation Service (formerly the Soils Conservation Services) Soil Survey of Volusia County (1980). The Soils Map 5-2 identifies the soils that are found in the Deltona and surrounding area.

### **SOILS OF THE SAND RIDGES**

**PAOLA-ORSINO:** This group is generally found on broad, high ridges of excessively drained and moderately well drained, grayish sandy soils that have a yellowish sandy subsoil. This map unit is associated with Karst ridges and interspersed with sinks, lakes, and wet depressions. Many landlocked lakes, sinks and wet depressions are distributed throughout the unit. Many lakes are shallow, intermittent and generally have marshy vegetation. The soils in this unit are sandy and droughty and have low natural fertility. Some parts of the unit have been developed from urban and residential use. Except in a

few low-lying areas, a high water table is not a constraint to development for this soil series.

**ASTATULA-TAVARES:** This map unit is generally found along broad, undulating ridges of excessively drained and moderately well drained, brownish and grayish sandy soils; interspersed with a few sinks, lakes, and depressions. This map unit is generally similar to that in the Paola-Orsino unit, but relief is generally not as great. In addition, the soils are not highly leached. The major soils of this unit are sandy and become even drier after a few days without rain.

### **SOILS OF THE FLATWOODS**

**MYAKKA-SMYRNA-IMMOKALEE:** These nearly level, poorly drained soils have a dark, organic-stained subsoil underlain by sandy material; interspersed with swamps and poorly defined drainage ways. This map unit, the largest in the county, is generally found in the broad flatwoods. Most soils of this unit have a seasonal high water table at or near the surface. The major limitation to the use of these soils for urban development is the wetness or the high seasonal high groundwater table.

### **Flora and Fauna Conditions**

The topography and soils of Deltona support a variety of vegetative and ecological communities some of which are considered rare by the Florida Natural Areas Inventory (FNAI). Some of these communities contain endemic species of flora and fauna. Pine flatwoods, live oak, sand pine, xeric oak, mixed wetland hardwoods, and cypress are all vegetative communities found in Deltona. Very characteristic to Deltona are the sand pine, xeric oak, longleaf pine and turkey oak communities found on the well drained soils of the Karst ridges.

The types of natural and built ecosystems of Deltona are described in the following subsections. For each natural system, selected indicator species are noted. These include species that are dominant, associated, or endemic to the ecosystem. Typical vegetation found in those communities may or may not actually occur in a given area. Species listed are among those most likely to be present, readily seen, and evident in any season.

## ***Vegetation Classification Land Use Codes***

### **100 - Urban and Built-up**

This land is primarily occupied by man-made structures. It includes cities, towns, villages, strip developments as well as highways, shopping centers, industrial complexes, and other commercial buildings. Residential areas are also included in this urban land use.

### **200/270 - Agriculture and Abandoned Fields**

Agriculture lands are those lands utilized for the cultivation of food crops and/or livestock. Agricultural lands include orchards, groves, nurseries, vineyards, horticultural areas, specialty farms, aquaculture, citrus groves, cropland, and pastureland. This land use also includes those areas that have been utilized as agricultural areas in the past but have since been abandoned.

### **329/330 - Shrubs and Brush - Mixed Rangeland**

Plant species dominant in this land use include saw palmetto, gallberry, wax myrtle, and other shrubs and brush. This land use is typically covered by saw palmetto but does include other woody scrub plant species, herbs and grasses. Rangeland refers to land where the natural vegetation is predominantly grasses, forbs, or shrubs and is capable of being used for grazing.

### **411 - Pine Flatwood**

This upland forest community has a canopy dominated by slash pine, longleaf pine or both. This community is often controlled by fire management which helps reduce hardwood competition and perpetuates the growth of pines and grasses. Slash pine is usually associated with moister sites, whereas, longleaf pine is found on drier sites. The sub-canopy and ground cover typically include saw palmetto, wax myrtle, gallberry and a wide variety of herbs and brush.

### **412/414 - Longleaf Pine/Xeric Oak - Pine Mesic Oak**

These upland forest communities have a canopy dominated by a mixture of pines and oaks including but not limited to the following species: slash pine, longleaf pine, sand pine, loblolly

pine, water oak, live oak, laurel oak, hickory, and sweetgum. The sub-canopy is dominated by blue-jack oak, turkey oak, live oak and other upland oaks and hardwoods and/or gallberry, wax myrtle, and saw palmetto. This community is typically associated with sandy soils.

#### **413 - Sand Pine**

The sand pine upland forest is dominated by sand pine in its canopy. Sand live oak, myrtle oak, Chapman's oak, scrub oak, saw palmetto, rosemary, and rusty lyonia are typically observed in the sub-canopy. The ground cover is minimal in these sand pine communities with open patches of sand and ground lichens often visible. This community in its natural state is dependent on fire to maintain diversity of species. In the Deltona area due to the exclusion of fire, many of these communities have succeeded to old age stands of mature sand pine with little understory or species recruitment.

#### **421 - Xeric Oak**

This community is an upland hardwood forest found in similar areas as the longleaf pine community. The canopy is dominated by (>66 percent) bluejack oak, turkey oak, sand live oak and the occasional scrub hickory. There are typically longleaf pines associated with this community as well, but they do not dominate the canopy. The sub-canopy consists mainly of seedling oak and pine species that occur in the canopy.

#### **425/427 - Temperate Hammock - Live Oak Hammock**

This community is typically found in moister sites and can include a variety of oaks, red bay, sweetbay, magnolia, sweetgum, sugarberry, hickories, cabbage palm, hollies and cedar in its canopy. The live oak hammock is commonly found along the upper banks of Florida's lakes and streams. Live oak is the predominant canopy with sweetgum, magnolia, holly, and laurel oak as minor associates.

#### **429 - Wax Myrtle/Willow**

This community is typically found on disturbed lands or along the fringes of other forest communities. There is no dominant tree canopy. The land is dominated by wax myrtle and

willow depending upon the moistness of the site. Wax myrtle is usually associated with less wet site conditions, while willow is common in wetland communities.

#### **432 - Scrub Oak**

This community may also be referred to as sand live oak due to the fact that sand live oak is the dominant canopy species. Other canopy species include; southern red cedar, cabbage palm, Chapman oak, myrtle oak, red bay, and holly.

#### **500 - Open Water**

This land use is defined as any area within the surrounding land that is persistently water covered. Open water includes stream and waterways, lakes, reservoirs, bays and estuaries, major springs, and slough waters. Any portion of the water body that has visible emergent or submergent vegetation should be classified separately under the appropriate wetland category.

#### **611 - Bay Swamp**

This wetland community is dominated by bay trees. The canopy typically has a mixture of the following species; loblolly bay, swamp bay, red bay, sweetbay, slash pine, pond pine and loblolly pine. The sub-canopy typically includes gallberry, fetterbush, wax myrtle, and titi.

#### **615/616/617 - Bottomland Swamp - Inland Ponds and Sloughs - Mixed Wetland Hardwoods**

The canopy and subcanopy is generally dominated by the following hardwood species; red maple, water oak, sweetgum, willows, tupelos, water hickory, bays, and water ash which are tolerant of hydric conditions. There may also be cypress, slash pine, loblolly pine, pond pine and shortleaf pine associated with the canopy and sub-canopy of this community.

#### **621/624 - Cypress Swamp - Cypress/Pine/Cabbage Palm**

This wetland community is dominated by either cypress, pine, and/or cabbage palm in its canopy. Swamp tupelo, slash pine, and black titi are also commonly associated with pond cypress. Whereas, water tupelo, red maple, American elm, and water hickory are commonly associated with bald cypress. Cypress dominated areas are typically hydric sites, whereas

intrusion by the pines or cabbage palm usually indicates the transition area between upland and hydric sites. It should be noted that a high water table is associated with this vegetative cover and not necessarily standing water.

**641/643 - Freshwater Marsh - Wet Prairie**

The freshwater marsh is a non-forested wetland system that typically contains a variety of herbaceous wetland vegetation, including; sawgrass, cattail, arrowhead, maidencane, buttonbush, cordgrass, switchgrass, bulrush, needlerush, common reed, spike rushes, St. Johns wort, and arrowroot.

**Listed Species**

The ecological integrity of a natural system depends upon the active presence of all of its components. The reason for endangerment of species and of ecosystems in Florida is usually loss of habitat, the place and conditions where the species of plant or animal lives are altered. For Deltona, most of the species listed for protection by Federal and State agencies are components of the Florida Scrub Ecosystem. Species are restricted to those available plants and animals able to make use of this environment. Many of the following listed species are components of the Florida Scrub Ecosystem. Others are dependent on pine flatwoods environments and wetland communities.

**Table 5-1**

Listed Species With the Potential to Occur in Deltona based on the FNAI element occurrences:

Scientific Name	Common Name	Federal Status	State Status*
<b>Reptiles</b>			

Scientific Name	Common Name	Federal Status	State Status*
<i>Alligator mississippiensis</i>	American Alligator	T	SSC
<i>Drymarchon corais couperi</i>	Eastern Indigo Snake	T	T
<i>Gopherus polyphemus</i>	Gopher Tortoise	C	SSC
<i>Neoseps reynoldsi</i>	Sand Skink	T	T
<i>Pituophis melanoleucus mugitus</i>	Florida Pine Snake	C	SSC
<b>Amphibians</b>			
<i>Rana capito</i>	Gopher Frog	N	SSC
<b>Birds</b>			
<i>Aphelocoma coerulescens</i> <i>coerulescens</i>	Florida Scrub Jay	T	T
<i>Aramus guarauna</i>	Limpkin	N	SSC
<i>Egretta caerulea</i>	Little Blue Heron	N	SSC
<i>Egretta thula</i>	Snowy Egret	N	SSC
<i>Egretta tricolor</i>	Tricolored Heron	N	SSC

Scientific Name	Common Name	Federal Status	State Status*
<i>Eudocimus albus</i>	White Ibis	N	SSC
<i>Falco sparverius paulus</i>	Southeastern American Kestrel	C	T
<i>Grus canadensis pratensis</i>	Florida Sandhill Crane	N	T
<i>Haliaeetus leucocephalus</i>	Bald Eagle	T	T
<i>Mycteria americana</i>	Wood Stork	E	E
<i>Picoides borealis</i>	Red-Cockaded Woodpecker	E	T
<b>Plants</b>			
<i>Acrostichum aureum</i>	Golden Leather Fern	N	E
<i>Asclepias curtissii</i>	Curtiss' Milkweed	N	E
<i>Bonamia grandiflora</i>	Florida Bonamia	T	E
<i>Calamovilfa curtissii</i>	Curtiss' Sandgrass	C	E
<i>Cereus gracilis var simpsonii</i>	Simpson's Prickly-Apple	C	E
<i>Chionanthus pygmaeus</i>	Pygmy Fringetree	E	E

Scientific Name	Common Name	Federal Status	State Status*
<i>Conradina grandiflora</i>	Large-Flowered Rosemary	C	E
<i>Deeringothamnus rugelii</i>	Rugel's Pawpaw	E	E
<i>Encyclia tampensis</i>	Butterfly Orchid	N	C
<i>Epidendrum conopseum</i>	Scrub Orchid	N	C
<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>	Scrub Buckwheat	T	E
<i>Garberia heterophylla</i>	Garberia	N	T
<i>Lechea cernua</i>	Nodding Pinweed	C	E
<i>Liatris ohlingerae</i>	Scrub Blazing Star	E	E
<i>Lilium catesbaei</i>	Southern Red Lily	N	T
<i>Lycopodium cernuum</i>	Nodding Clubmoss	N	C
<i>Nemastylis floridana</i>	Fall-Flowering Ixia	C	E
<i>Nolina atopocarpa</i>	Florida Bear-Grass	C	E
<i>Nolina brittoniana</i>	Scrub Beargrass	E	E

Scientific Name	Common Name	Federal Status	State Status*
<i>Osmunda cinnamomea</i>	Cinnamon Fern	N	C
<i>Osmunda regalis</i>	Royal Fern	N	C
<i>Polygala lewtonii</i>	Scrub Milkwort	N	E
<i>Spiranthes torta</i>	Southern Ladies' Tresses	N	E
<b>Mammals</b>			
<i>Podomys floridanus</i>	Florida Mouse	N	SSC

E = Endangered

T = Threatened

SSC = Species of Special Concern

C = Candidate Species

N = Not Currently Listed

\* The State Status is based upon the official lists published by the Florida Game and Fresh Water Fish Commission (August 7, 1997) entitled "Florida's Endangered Species, Threatened Species and Species of Special Concern."

The most notable occurrence of listed species in Deltona are the gopher tortoise and scrub jay both of which are found in the Florida Scrub ecosystem. The high percent of scrub habitat and

encroaching development poses a concern for the listed species which are dependent on such habitat. The gopher tortoise is a state listed species of special concern. This means that it is not threatened or endangered but has the potential to become threatened thereby warranting special protection. The Scrub jay is listed as a threatened species by the FGFWFC and the US Fish and Wildlife Service (USFWS). This means that it is vulnerable to endangerment in the near future. Despite the extent of existing development in Deltona, the City has one of the highest scrub jay populations in the county, located in Section 16. This social species has adapted to living in remnant scrub areas, foraging in sand roads and rights of way as well as some yards in the more populated areas of Deltona. Pockets of families also exist on substantial parcels of undeveloped land in and around Deltona.

### ***Air Quality***

At the time of adoption of Volusia County's Comprehensive Plan, the County was in attainment for air quality purposes. Volusia County has since expanded its mass transit system and retrofitted one of its oil burning Power Plants to natural gas.

### ***Commercially Valuable Minerals***

To date there are no significant deposits of industrial minerals documented within the City. Other minerals such as clay, sand and shell are mined locally and used for local construction projects. There are no mining operations in Deltona presently.

### ***Commercial / Recreational Use of Natural Resources***

While there are a host of local parks and one regional county (Section 16) passive recreational (environmental) facility in the City, most cater to urban recreational activities such as children's playgrounds or baseball/football fields. Freshwater lakes are among the City's most valuable assets. More than 120 lakes within Deltona are larger than 5 acres. Most occur along the Karst topography of the DeLand ridge. Large springs on the low slopes of the DeLand Ridge discharge water that has infiltrated the ridge. Further discussion on the urban recreational areas of the City can be found in the Open Space and Recreation Element of the City's Plan.

## ***Managed Natural Areas***

Volusia County has taken a proactive approach to land management geared toward the preservation of listed species and associated habitat. The "Section 16" restoration project, located within Deltona, is a prime example. This parcel is owned by the State of Florida and leased by the school board of Volusia County and is noted to contain extensive xeric oak/sand pine habitat. The County recognized the opportunity to not only preserve and restore this valuable land, but to turn it into an educational opportunity. The low canopy xeric oak condition is ideal scrub jay and gopher tortoise habitat. Several scrub jay families currently occupy the area and the property has the potential to support more scrub jay families. The scrub areas are maintained with fire and/or mechanical measures on a periodic basis to emulate natural conditions. Also dovetailed with the Section 16 restoration project is an upland habitat mitigation component for scrub jays and gopher tortoises. Four hundred acres of this section have been earmarked for a scrub restoration project. Two hundred acres of the project have been restored from a sand pine forest to a low canopy xeric oak condition. The project site has successfully succeeded to a low canopy xeric oak state, ideal for scrub jay habitat. To date, the project restoration has been completed on 100 acres of the property and has attracted several families of jays. In addition, the restoration areas were used as a relocation area for gopher tortoises that were displaced by a County project.

## **ANALYSIS OF NATURAL RESOURCES**

In this portion of the Element, the long-range directions or plans for various resources are presented. This section further provides the basis for the Goals, Objectives and Policies provided in Section IV.

### ***Air Quality Plan***

Air quality within Volusia County is within attainment levels of the EPA, it will be necessary to stay up to date on current air quality trends since the City is predicted to have a large influx of residents. The City should remain apprised of this situation through ongoing interaction with

the County's Planning Agency, and, if necessary, be prepared to offer a position or specific options.

The City should also work with the County to improve traffic flow and minimize congestion, thus cutting down on potential air quality problems. Potential point sources of air pollution should be evaluated with respect to impacts on residential areas and, where feasible, include a coordinated review by the County.

### **Surface Water Quality**

The City's surface waters provide excellent recreational and aesthetic amenity. Since the City has several potable water wellfields and high recharge rates of the Surficial Aquifer, it is suggested that increased local regulatory actions may be necessary to protect the integrity of the area wide water supply. Efforts to maintain and improve the quality of local water resources should be given a high priority.

It has become evident that diverse sources of water pollution (non-point sources), not solely industrial pollutants, are major contributors to water quality degradation. Studies, including the Nationwide Urban Runoff Program (NURP) Study (EPA, 1983), indicate that stormwater runoff from urban and industrial areas typically contains the same general types of pollutants that are often found in wastewater in industrial discharges. Pollutants commonly found in stormwater runoff include heavy metals, pesticides, herbicides and synthetic organic compounds such as fuels, waste oils, solvents, lubricants and grease. Compounds such as phosphorous and nitrogen are also common pollutants from fertilizers, associated with residential stormwater runoff. These compounds can have damaging effects on both human health and aquatic ecosystems. Every effort should be made to incorporate pollution control devices in drainage facilities. The City may also want to consider developing a program to retrofit older structures or facilities with various devices or to provide alternative drainage systems designs in lieu of unrestrictive positive drainage. Recommendations from a drainage study currently underway will address surface water quality.

## **Surface Water Pollution**

The biggest source of water quality degradation within the County appears to be stormwater runoff. Stormwater is the flow of water which results from, and which occurs immediately following, a rainfall event. Stormwater typically carries with it a heavy pollutant load that typically ends up in the streams and waterways located within the City. Estimated pollutant loads for the future land use condition, and a comparison of the existing and future pollutant loads to the receiving waters were identified within the Deltona Watershed Study. In order to evaluate the effects of different land uses on the pollutant loads, annual pollutant loads (lbs/acre) were determined for each sub-basin. It was estimated that significant increases in pollutant loads (greater than 25%) will occur, for one or more pollutant parameter, in the majority of the sub-basins within this basin. The cause of the increased loading in these sub-basins is primarily a function of the intensity of the land use. These sub-basins contain heavy residential development, much of which was built without the benefit of Best Management Practices (BMPs).

The large increases in pollutant loading anticipated in the future is due to the fact that approximately 40% of the Lake Theresa Basin land area is expected to change from low-density residential to medium-density residential, without the benefit of stormwater treatment. Due to the nature of the defined land use, "Low-Density Residential 2", development within this land use is being permitted without any additional storage or treatment of runoff being provided. The pollutant loads presented are based on the volume of rainfall that occurs in the Deltona area. The portion of pollutants that run off during a particular time frame is equal to the total pollutant loading multiplied by the percentage of annual rainfall that occurs during that time frame.

## **Wetlands Plan**

Since viable wetlands remain in the City, several efforts should be undertaken to preserve and improve wetland conditions. Platting activities in the City includes requirements of identifying areas of wetland vegetation. State and/or federal permitting pertaining to design requirements also apply in those instances where jurisdictional wetland habitats are known to exist.

The City may want to consider modifications to local subdivision regulations which would require sensitive design in those areas where wetlands occur. Requirements to eliminate exotic trees species, to preserve or improve local vegetation and water flows, and in some cases to reintroduce a variety of wetland species to encourage habitat development, are desirable. Stringent enforcement of requirements for enforcement of upland buffer zone requirements adjacent to wetlands should also occur.

### **Water Conservation**

Recognizing that a sufficient and affordable fresh water supply is critical to any area, and that development increases pressure on the productiveness of the local Surficial and Floridan Aquifer, it is imperative that efforts to minimize overall water consumption be given a high priority. The City should implement a variety of actions towards meeting this objective as follows:

- Compliance with the State Water Conservation Act (F.S. 553.14) to require water conservation fixtures on all new construction.
- Meter all water users.
- Promotion of conservation tips in the utility customer handbook as well as periodic messages in customers bills.
- Presentation of water conservation educational programs and pamphlets that encourage water saving measures such as Xeriscape

The City should also remain apprised of potential future efforts to regionalize raw water withdrawal areas. Since the City presently services a large and growing population, it is predicted that the City would play a major role in the regionalization decision and/or manner in which this proposal might be locally implemented.

## **Soil Erosion Plan**

While soil erosion is not considered to be a significant local problem, continued enforcement of local subdivision and excavation and fill regulations, as well as other best management practices, should be maintained. Development of local programs to landscape or mulch private or public areas which are presently devoid of ground cover would also positively contribute in this respect. More detailed examination of erosion problems along the City's lakes, canals and waterways could also lead to the development of programs to minimize this occurrence.

## **Groundwater Pollution**

Groundwater supplies are fragile and subject to pollution from a number of potential contaminants. Stormwater runoff, septic tanks and reduced groundwater levels constitute three threats to groundwater supplies. Such threats are significant, because if the Volusia-Floridan Sole Source Aquifer were sufficiently contaminated, no cost-effective alternative for providing potable water exists within Volusia County.

Declines in the water table of the surficial aquifer may adversely affect the hydrologic regime in wetlands causing harm to native wetland vegetation. Declines in the potentiometric surface of the Floridan aquifer could result in inadequate supplies of suitable quality water due to saltwater intrusion near inland wellfields.

The SJRWMD identifies areas considered Priority Water Resource Caution Areas (PWRCA). This assessment is designed to identify areas where water supply problems have become critical or are predicted to become critical by the year 2010. The primary procedure used to determine the PWRCA is to compare groundwater level and quality changes, based on existing and future needs, with thresholds for various impact criteria. The four impact criteria used in the assessment are: impacts to natural systems, ground water quality, existing legal users, and failure to identify an adequate public water supply.

Due to its location above the main recharge area, Deltona is considered to be a PWRCA. Source protection focuses on efforts to protect public water supply quality and quantity related to three types of sources: aquifer recharge areas, wellhead areas, and surface water. There are no

sources of surface water public supply in this county. All of the public water supply comes from the Volusia - Floridan aquifer. Wellhead protection areas are designated by the local government to protect the groundwater source for a well, intended for human consumption for a community water system and includes the surface and subsurface area surrounding such a potable wellfield. The City should continue to work with Volusia County in all area-wide wellfield protection and regulatory activities.

### ***Floodplain Analysis***

The high-frequency floodplain serves many vital functions. First and foremost, it acts as a buffer and storage area for potential floodwaters. Secondly, wetland vegetation traps sediment and assimilates nutrients from stormwater run-off, which helps to protect water quality in the lakes. The services provided by the floodplains above the wetland limits are less obvious, and usually only become apparent after the functions are lost.

Drainage problems identified in the DRMP study consist of landlocked sub-basins, where no positive outfall is available; and nuisance flooding problems in the secondary stormwater system. Construction in the low lying areas creating nuisance water quantity problems, consisting of standing water along roadsides, sidewalks and driveways. They are caused by a number of factors including inadequate swale size and slope, coupled with a high ground water table from excessive rain and a shallow confining layer under the ground surface. The soil remains saturated for long periods of time, causing road damage, inconveniences and the potential for infiltration through concrete house pads. Subsequent rain events have the potential to cause structural flooding as a result of having no soil storage for runoff.

During large storm events, lakes and rivers overflow their usual boundaries and expand outward over areas which are not usually inundated. In places with flat topography, the surface area flooded by a relatively small increase in the flood stage can be vast. Any structure built within the floodplain may be subject to flood damage. In addition, structures or fill within the floodplain may exacerbate flooding by reducing the storage or conveyance of floodwaters. The placement of fill in the floodplain displaces a roughly equivalent amount of water, thereby raising flood stages higher than if the fill had not been there. The cumulative effects of many fill

projects in the floodplain can raise flood stages to levels that inundate structures which were previously above the floodplain.

Flooding has become a serious problem in the developed areas of southwestern Volusia County. The increase of impervious surfaces in these closed drainage basin systems has caused flooding. In addition many of these areas were developed with inadequate or no stormwater management systems. In many cases, roads or homes were constructed within the floodplain areas because sufficient information as to flood elevations was unavailable. Some basins that have exhibited flooding problems have been pumped to the St. Johns River. Pumping the closed drainage basins that are located on the DeLand Ridge to the St. Johns has eliminated a portion of the aquifer recharge budget. Some have suggested that a drainage network be constructed to the St. Johns River in order to alleviate flooding on the Ridge. However, it is suggested that draining these closed basin areas to the river would not be the appropriate solution because drainage to the river could negatively impact recharge on the DeLand Ridge. Retention areas on the Ridge may be an appropriate cause of action to manage flood waters and enhance recharge.

### ***Flora and Fauna Plan***

Like many central Florida communities, the City of Deltona has suffered from the historical impact of relatively insensitive development practices. The City contains few parcels of regionally ecological significant habitat. Less than 2% of the Florida Scrub Ecosystem once occupying parts of the County remain in the few sites that have survived to date. Fortunately, the City of Deltona holds a valuable resource within the Section 16 restoration project. This extensive xeric oak/sand pine community is home to wildlife such as the gopher tortoise and scrub jay both state listed species. It would be in the best interest of the City to protect this area to the furthest extent possible, not allowing for developments to encroach on this vital resource.

The City should actively support the prudent use and, to the maximum extent feasible, the preservation of all remaining natural vegetation and wildlife resources. The City should solicit federal, state, regional, or county grant funds to purchase ecologically significant sites that remain within the City. Another option would be to develop a regional or local parks district with taxing authority to purchase or otherwise control valuable sites. In addition, the City

could strive to recreate, restore or otherwise improve areas of former ecosystems which are no longer found in any reasonably pristine condition.

### **Hazardous Waste Management Plan**

It is realistic to expect hazardous materials users to exist within any city. Since the state and county have the primary responsibility, the resources, and the overall expertise to effectively manage this situation, the principal role of the City should be to coordinate efforts with these agencies.

Under the requirements of the Water Quality Assurance Act of 1983, Volusia County Environmental Control Division performed a hazardous waste assessment of the generation, storage and disposal methods of firms generating hazardous waste within the County. The study identified that over 12 million pounds of waste generated in the County is being improperly disposed of in undeveloped areas. No County owned landfills are operated within the City limits of Deltona. According to the report, one abandoned dump site was identified within the city limits, but consists mainly of construction/demolition debris and household materials. Due to the sandy soil and location over the aquifer, it was also determined that a hazardous waste storage facility should not be located within the city limits.

## **COMMUNITY VISION**

*Deltona will attempt to strike a balance between the built environment and nature. Deltona's conservation plan for 2017 will protect water quality in lakes, natural resources in parks, endangered and natural habitat areas as well as open public spaces.*

### **Water Recreation/Stretch Goal**

The City should work toward improving lake water quality; as well as, designate and provide access to several specific lakes for water recreation uses.

### **Vision Workshop Results**

Birds / trees / lakes

Clean lakes

Parks