ALACHUA COUNTY COMPREHENSIVE PLAN: 2011-2030
EVALUATION AND APPRAISAL ISSUE SUMMARY

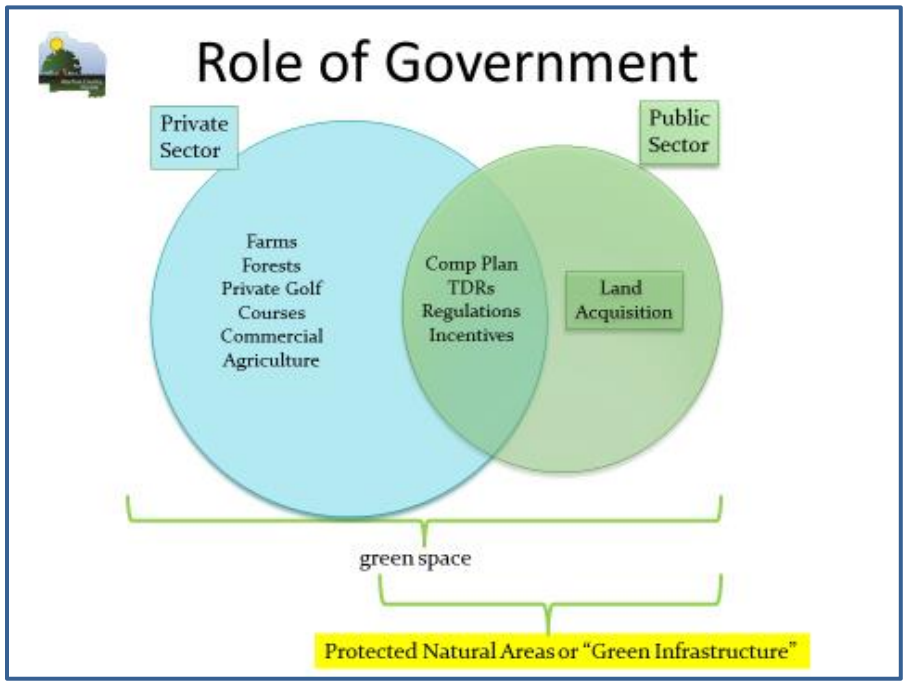
April *3, 2018*

Green Infrastructure in the Built Environment

INTRODUCTION

This issue paper addresses items related to green infrastructure in the Comprehensive Plan and includes wetland and buffer protection, water conservation, stormwater, open space and resource protection strategies related to development activities. Parks and Habitat acquisition and management is also a significant component of Green Infrastructure and is covered in a separate issue paper. Green infrastructure can be defined as nature-based services that provide a cost-effective approach to managing water and natural resources, protect our water supply and reduce flooding, and serve to provide an ecological framework for social, economic, and environmental health for a resilient community. Green infrastructure concepts include upland and wetland habitat protection, restoration and acquisition (see *Green Infrastructure – Land Conservation and Parks Issue Paper* for details); water conservation strategies; water quality and stormwater management; and can incorporate Low(er) Impact Design (LID), conservation development concepts, and other approaches in an effort to maximize ecological functions and benefits.

The county has taken a holistic approach to green infrastructure since the adoption of the 2001-2020 Comprehensive Plan. Since the adoption of that Plan, the county has incorporated LID options, new water quality requirements, additional buffer and wetland protection standards, initiated new land acquisition and management programs, and incorporated new land development code requirements for open space, clustering and added incentives for LID, Transfer of Development Rights (TDRs) and conservation development strategies. Additionally, ordinances focused on water quality and water conservation have been adopted and implemented.



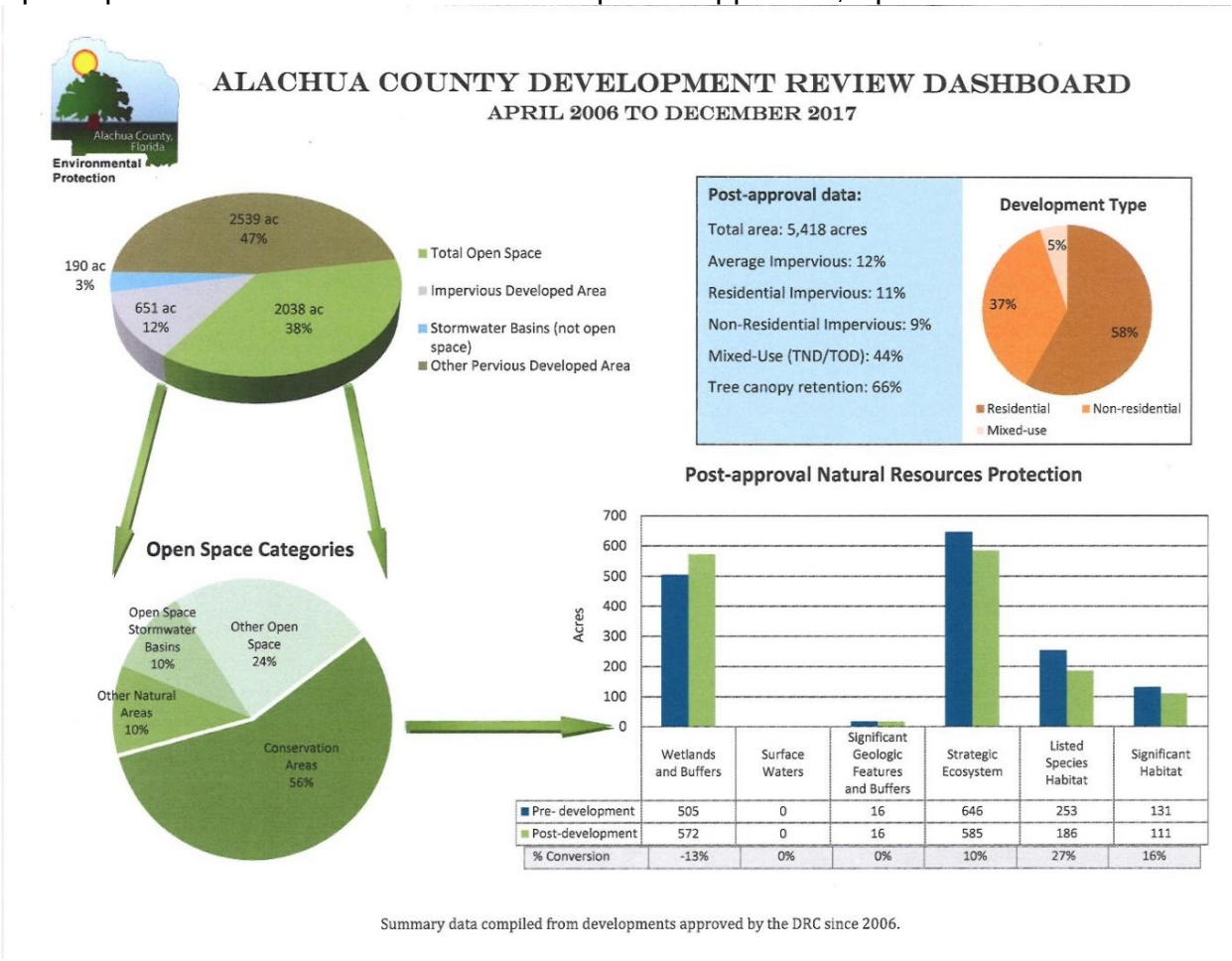
This holistic approach has been very successful in protecting many of our natural and conservation resources in Alachua County. These accomplishments include over 24,000 acres of natural areas protected since 2000 (discussed in separate paper) as well as protection strategies that have been in place since 2005 or earlier, including strong wetland and surface water avoidance and buffer requirements, open space requirements, conservation area protection as part of land development, and required clustering in the rural areas. These results are summarized in the Development Review Dashboard included in the Data and Analysis Section.

In 2008, the County was recognized by the National Association of Counties (NACO) "Best of Category" Achievement Award, Planning Category, for the County's success in integrating and leveraging local investment in the environmental protection provisions of the County's Comprehensive Plan and development review process and through the Alachua County Forever land conservation program. This Evaluation and Appraisal process gives us a chance to review our efforts and make any changes necessary to continue to optimize our green infrastructure investment opportunities.

Between April 2006 and December 2017, approximately 2,038 acres were approved to be preserved as open space within approved development in accordance with the Comprehensive Plan open space requirements. The breakdown of the types of permanent open space set aside within approved developments is shown in the diagram below. During this time period, 1,470 acres of the open space conserved as part of approved development plans has been comprised of conservation areas, which include wetlands, surface waters, floodplain areas, listed species habitat, significant geological features, and strategic ecosystems. The remainder of the preserved open space has been comprised of other natural areas, other pervious areas, and

stormwater management areas which qualify as open space.

Open Space Preserved within New Development Approvals, April 2006 to December 2017



Summary data compiled from developments approved by the DRC since 2006.

While the current Comprehensive Plan has many effective policies, there are areas that could be improved to address the ongoing challenges we face related to the protection of our aquifer and water supply, flooding and stormwater issues, sinkholes, and air and water quality problems and challenges that come with population growth and related development impacts and patterns. These issues and potential solutions are introduced in the remainder of this paper.

ANALYSIS RELATING TO ISSUES

WATER CONSERVATION

Advisory Groups Issues:
Issue: Expand Alachua County's irrigation ordinance from unincorporated area only to cover the entire County

Issue: Develop additional water conservation measures for new construction, both commercial and residential

Introduction:
Alachua County predominately relies on groundwater for our water needs. According to data compiled in the North Florida Regional Water Supply Plan (NFRWSP), an estimated 49.60 million gallons a day (MGD) of groundwater was pumped in Alachua County in 2010. The largest water use in the county is public supply (25.46 MGD or 51%) that is metered and provided by utilities. This use is largely driven by residential water use, but also includes commercial and industrial uses that are supplied by local utilities. Domestic self-supply includes the estimated water use from private residential wells and is relatively small at 3.53 MGD and 7% of the total water use. Agriculture is the second largest use at 16.75 MGD and 34% of the total use, and is mostly estimated based on calculations of crop coverage, crop needs, and rainfall data. Power generation represents 5% of the total water use at 2.5 MGD, while industrial uses that rely on wells instead of public supply represent 1% of the total water use at 0.67 MGD. Recreational water use represents golf courses within Alachua County and is low at 0.69 MGD and 2% of the total use.

The 2016 Water 2070 report from the University of Florida states, “The clear takeaway is that development-related water demand is the major driver of increased water consumption in Florida by 2070, and that the combination of more compact development patterns and modest water conservation measures would result in a fairly significant reduction.” The report identified reducing water used for landscape irrigation as the single most effective strategy for reducing water use, since at least 50% of household water use is used for irrigation. While Alachua County adopted an Irrigation Design Code in 2015 for improving the efficiency of new irrigation systems in unincorporated Alachua County, the current trend is still to install landscapes dominated by irrigated turf in new construction.

Some areas have turned to the use of reclaimed water for irrigation as a strategy to reduce potable water use. While this practice has some advantages, it also has the unintended consequence of increased nutrient pollution, while encouraging over irrigation and the use of water intensive landscaping materials. Additionally, water management district irrigation restrictions do not apply to reclaimed water, which complicates enforcement of the water conserving restrictions. As landscapes become less water intensive due to conservation measures and changes in development patterns, extension of reclaimed water systems for landscape irrigation becomes less of a priority. The best uses of reclaimed water is for industrial uses that offset potable demand and for recharging the aquifer following additional treatment, such as that

provided by infiltrating wetlands.

Alachua County has long promoted the conversion of water and fertilizer intensive landscapes to less intensive ones, such as Florida Friendly Landscaping. EPD is currently offering a 50% rebate up to $2,000 for each property that reduces irrigated turf. While this grant-funded program is off to a good start, participation is dampened by the barriers presented by Homeowners Association landscaping policies. While the 2009 Florida Friendly Landscaping legislation aimed to reduce these barriers, the legislation failed to identify an enforcement mechanism. The Evaluation and Appraisal process provides an opportunity to explore mechanisms to reduce these barriers in an effort to encourage landscapes that are protective of water quality and quantity.

An additional challenge to creating sustainable landscapes is screening requirements (fencing, walls, etc.). Fencing is often added after landscapes are designed and installed; creating inefficiently irrigated landscapes and fragmented open spaces. These unintended consequences will be explored by staff during this process of identifying techniques for maximizing water conservation for new construction.

Potential Strategies for Addressing the Issues

The Existing Comprehensive Plan Policies recognize the importance of reducing outdoor water use, but the County should consider updating the language to maximize water conservation potential. In particular, staff will evaluate the current language in the Conservation and Open Space Objective 4.5 Groundwater and Springs, the Potable Water and Sewer Element Objectives 4.1 and 8.1, and the Energy Element Objective 1.1. Strategies to reduce permanent irrigation and to increase the participation in the Florida Water Star program will be explored. Policies designed to encourage sustainable landscaping and reduce the trend of landscapes dominated by irrigated turf will be provided. Policies addressing reclaimed water and treated effluent will be evaluated and strengthened to avoid negative unintended consequences and inconsistencies. Additionally, language to assist with overcoming the barriers of Homeowners Associations resistance to less water and fertilizer intensive landscapes and improvements to screening requirements will be investigated. Finally, the Comprehensive Plan currently uses the outdated “xeriscape” terminology. This term has been phased out of state and local programs and will be replaced with more current language.

SURFACE WATERS

Introduction

Newnan’s, Lochloosa, and Orange lakes have been determined by the Florida Department of Environmental Protection (FDEP) to be impaired waters under the Florida Watershed Restoration Act (Chapter 403.067, Florida Statutes [F.S.]) and the Impaired Surface Waters Rule (Rule 62-303, Florida Administrative Code). Both Newnan’s Lake and Lochloosa Lake are impaired for nutrients (nitrogen and

phosphorus) and Orange Lake is impaired for phosphorus. Total Maximum Daily Loads (TMDL) were developed for Newnan's and Orange lakes in 2003 and Lochloosa Lake and Cross Creek in 2017. TMDLs for fecal coliform for Hogtown, Sweetwater Branch, and Tumblin creeks were developed and finalized in 2003 and are still in effect. A basin management action plan (BMAP) outlining projects for water quality improvement in the Orange Creek Basin (OCB) was completed in 2007 and adopted in 2008. Phase 2 of the OCBMAP was adopted in 2014, with a focus on water quality improvement for the major lakes in the OCB.

The Santa Fe River Basin (SRB) was verified as impaired by nutrients based on elevated chlorophyll a and the presence of algae. It was included on Florida's Verified List of impaired waters for the SRB that was adopted by Secretarial Order on June 3, 2008. The purpose of this TMDL is to establish the allowable amount of pollutants to the Santa Fe River that would restore the river and springs to meet their applicable water quality criteria for nutrients (the springs 0.35 mg/L nitrate standard). TMDLs for fecal coliform bacteria, developed in 2014, in the SRB include six steams in Alachua County: Pareners Branch, Mill Creek, Monteocha Creek, Turkey Creek, Hague Branch (Cellon Creek), and Blues Creek. The Santa Fe River BMAP was adopted in 2012.

Minimum flows and levels (MFLs) are the minimum water levels and/or flows adopted by the water management district governing boards to prevent significant harm to the water resources or ecology of an area resulting from water withdrawals permitted by the districts. Establishing MFLs is a requirement of Florida Statutes 373.042(2).

MFLs define how much water levels and/or flows may change and still prevent significant harm. MFLs take into account the ability of water resource-dependent communities to adjust to changes in hydrologic conditions. MFLs allow for an acceptable level of change to occur. MFLs apply in water management district decisions regarding water use permits, and computer models for surface and groundwaters are used to evaluate the effects of existing and proposed water withdrawals on water resources and ecological systems. The water management districts are required to develop recovery or prevention strategies in those cases where a water body currently does not or will not meet an established MFL. Water uses cannot be permitted that cause any MFL to be violated. Each water management district is required to annually update their priority water body list and schedule for the establishment of MFLs for surface waters and aquifers within their respective districts. The Lower Santa Fe and Ichetucknee Rivers and Priority Springs MFLs were adopted by DEP in 2015.

Potential Strategies for Addressing the Issues

The policies related to Total Maximum Daily Loads, Basin Management Action Plans, and Minimum Flows and Levels are out of date and should be updated. Staff will review and update the existing policies in Objective 4.6 Surface Water.

STORMWATER

Advisory Groups Issues:

Issue: Review policies related to Low Impact Development techniques and current research and data on the effectiveness of Low Impact Development techniques for stormwater management (EPAC)

Issue: Review policies regarding karst topography and sinkhole issues related to development (RCAC)

Introduction

Urban development can degrade water quality by accelerating eutrophication in surface waters receiving runoff and can increase nutrients in groundwaters. The reduction in pervious surface and vegetation in the developed landscape removes natural filtration mechanisms and increases pollutant loads discharged into receiving waters. Fertilizers, pesticides, bacteria, oils and greases, and other pollutants characteristic of urban land uses are flushed from the watershed during storms becoming trapped in stormwater. In Florida, excess nutrients are the greatest water quality issue facing our surface and groundwaters. The Florida Department of Environmental Protection (FDEP) adopts Total Maximum Daily Loads (TMDLs) that sets a watershed-based pollutant loading cap for these “impaired waters.”

The ultimate stormwater management goal is to minimize the adverse effects of urban development on communities, watersheds, water bodies, wetlands, floodplains, and other natural systems. More specifically, these goals include:

- Pollutant load reduction as needed to ensure that discharges do not cause or contribute to violations of State water quality standards.
- Preventing or reducing on-site and off-site flooding.
- Maintaining or restoring the hydrologic integrity of wetlands and aquatic habitats.
- Maintaining and promoting groundwater recharge with clean water.
- Minimizing erosion and sedimentation.
- Promoting the reuse of rainfall and stormwater.

Stormwater treatment systems use best management practices (BMPs) that can be categorized into two basic categories:

(a) Nonstructural BMPs (source controls). These BMPs are used for pollution prevention to minimize pollutants getting into stormwater or to minimize stormwater volume. They include site planning BMPs such as preserving vegetation, clustering development, and minimizing total imperviousness or directly connected impervious areas. They also include source control BMPs such as minimizing clearing, minimizing soil compaction, and using Florida Friendly Landscapes and fertilizers.

(b) Structural BMPs. Structural BMPs are used to mitigate the changes in stormwater characteristics associated with land development and urbanization. Structural BMPs include retention and detention basins and filtration systems.

Low Impact Design or Development (LID) is a stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation, and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project's design, especially it's landscaping and open space. Successful adoption of LID stormwater management requires a fundamental shift in thinking from the traditional "collect, concentrate, convey, centralize, and control" approach to a new stormwater management mantra of "retain, detain, recharge, filter, and use". Unlike conventional stormwater systems, which typically control and treat runoff using a single engineered stormwater BMP located at the "bottom of the hill," LID systems are designed to promote volume attenuation and treatment at or near the source. LID systems use a suite of stormwater BMPs – site planning BMPs, sustainable landscaping, source control BMPs, and structural BMPs such as retention, detention, infiltration, treatment and harvesting mechanisms – that are integrated into a project site to function as a "BMP treatment train."

Sinkholes and other karst features are natural and common geologic features in areas underlain by limestone and other rocks that are dissolved by water. In north-central Florida, sinkholes are formed by solution of near-surface limestone and by collapse of surface materials into underlying cavities in rock. Rapidly forming sinkholes rarely occur under natural conditions. Sinkholes most commonly form in western and central Alachua County, in areas where limestone is exposed or thinly covered by less than 25 feet of permeable sand. Sinkholes are less common where clay-containing materials are over 100 feet thick, such as in eastern Alachua County. Sinkholes have been increasingly common over the past twenty-five years, primarily due to human activities such as groundwater withdrawal, surface water diversion, and pond construction.

Soil and sediment subsidence (sinking) are common during periods of high rainfall, especially when preceded by dry periods. Land subsidence results from a number of factors, one of which is sinkhole development. Common causes of subsidence not related to sinkhole formation include decay of land-clearing debris buried when a structure was built, decay of tree stumps and large roots, leaking water pipes and fittings, cracked and leaking swimming pools, cracked stormwater piping carrying away soil with the stormwater runoff, poor compaction of soil around utility lines, and runoff from roofs, gutters, and pavement.

Potential Strategies for Addressing the Issues

Low Impact Design techniques are encouraged in the Future Land Use Element Objectives 1.6, 2.1; Stormwater Management Objective 5.1; COSE Objective 3.6, 4.5 and Energy Element 3.2. Staff is evaluating the existing policies) in order to provide consistent and specific language for the implementation of LID techniques including, but not limited to, non-structural BMPs (such as landscaping and soil preparation requirements) and structural BMPs (such as limiting the use of basins that use constructed vertical drainage connections between the retention basin and a more pervious underlying geological formation, typically the Floridan aquifer).

The policies in the Stormwater Element, Objective 5.1 and COSE, Objectives 4.4, 4.6, 5.2 primarily focus on the protection of existing sinkholes and other sensitive karst features; staff will evaluate policies designed to minimize the formation of new sinkholes within stormwater treatment basins by the application of LID practices.

GROUNDWATER AND SPRINGS

Advisory Groups Issues:

Issue: Review aquifer recharge and water quality standards taking into account state standards (EPAC)

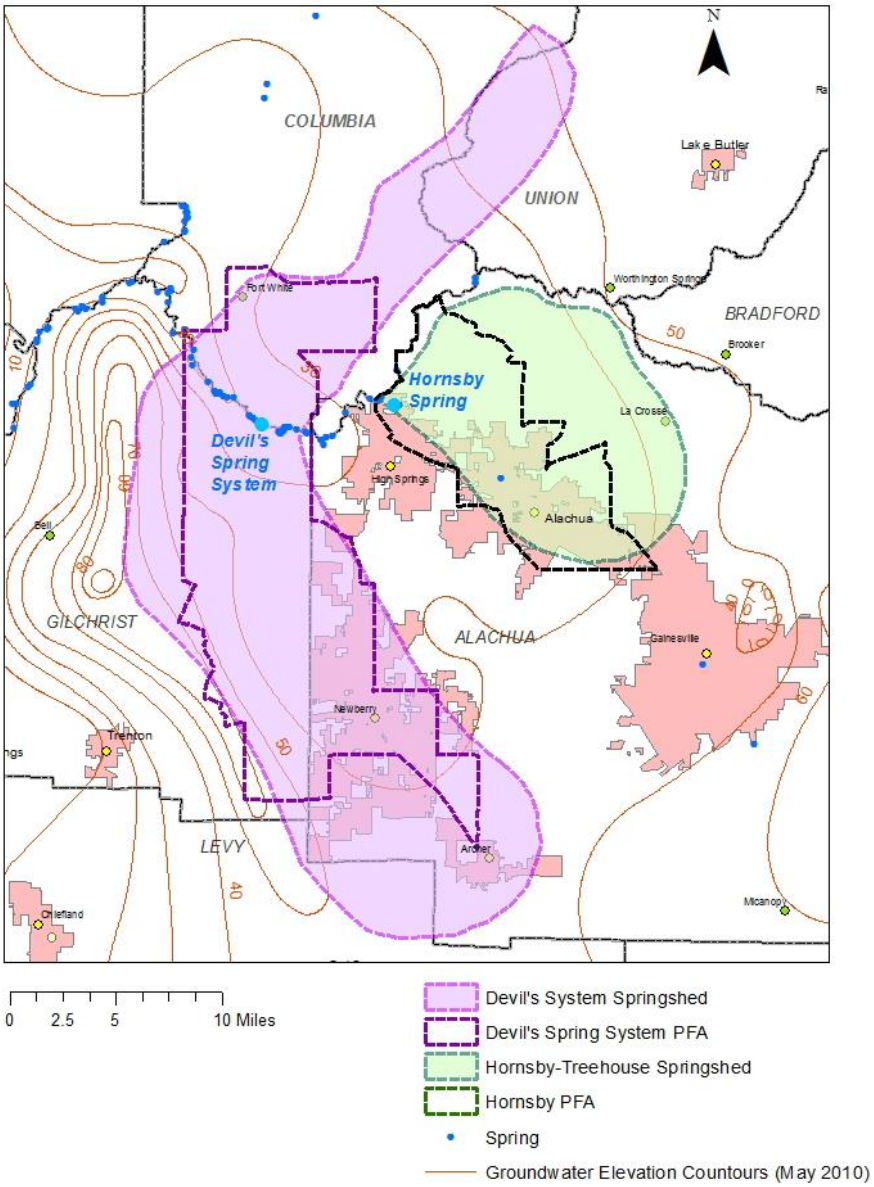
Introduction

COSE Objective 4.5 contains the majority of policies associated with aquifer recharge, springs protection and groundwater. One of the most significant changes in the State regulatory framework since the adoption of the current Comprehensive Plan is the adoption of the Florida Springs and Aquifer Protection Act, adopted by the Florida Legislature in 2016 (Chapter 373, Part VIII, Florida Statutes [F.S.]). Under the Florida Springs and Aquifer Protection Act, the Florida Department of Environmental Protection (FDEP) is required to delineate priority focus areas (PFAs) for all Outstanding Florida Springs identified as impaired. FDEP has completed draft Priority Focus Areas for two areas with impaired Outstanding Florida Springs in the vicinity of Alachua County; Devil's Spring System and Hornsby Spring. "Priority Focus Areas" means the area or areas of a basin where the Floridan Aquifer is generally most vulnerable to pollutant inputs where there is a known connectivity between groundwater pathways and an Outstanding Florida Spring." (Chapter 373, Part VIII, FS 2016). The Priority Focus Areas will eventually become the geographic basis for important regulatory, funding, and protection measures by the Florida Department of Environmental Protection, Water Management Districts, and local governments.

Poe Spring is also an Outstanding Florida Spring, but does not currently meet the Florida Department of Environmental Protection definition of impairment. While Poe is currently not listed as impaired for nitrate, there is substantial supporting hydrogeologic and groundwater data available that support the protective measures afforded of PFAs. High aquifer vulnerability, the presence of soils with high leaching potential, and the large number of septic systems in this springshed clearly

demonstrate the need for a PFA for Poe Spring. Delineating a PFA for Poe Springs would aid Alachua County in proactively taking measures to protect the spring in hopes of preventing further impairment and expensive remediation activities.

Additionally, some of the wellhead protection policies in the current Comprehensive Plan are out of date and should be updated. Many of the wellhead protection areas are small water systems at mobile home parks or other uses which are protected by the Hazardous Materials Management Code. Alachua County is pre-empted from regulating well construction and for the most part these are located on private property and operated by private owners or contractors.



Potential Strategies for Addressing the Issues
Staff will review the existing policies in Objective 4.5 Groundwater and Springs and consider the establishment of a priority focus area and corresponding protections for Poe Springs consistent with the criteria developed by the Florida Department of Environmental Protection under the Florida Springs and Aquifer Protection Act. Additionally, staff will update the existing wellhead protection policies in Objective 4.5.

WETLAND PROTECTION

BOCC and Advisory Groups Issues:

Issue: Consider increased protection for Outstanding Florida Waters (OFWs) (EPAC, BOCC)

Issue: Expand and strengthen protection of wetlands and buffers countywide (Sierra Club sent to BOCC)

Introduction

The protection of our wetland and surface waters has been recognized as one of the most critical needs of our community to protect our aquifer and minimize the impacts from severe weather events. This includes not only preserving these water resources but also maintaining sufficient upland natural buffers around these features. The uplands areas adjacent to wetlands are essential to their survival and functionality. Buffers protect and maintain wetland function by removing pollutants and sediments from stormwater runoff, removing nutrients and contaminants from upland sources, and increasing or maintaining their habitat value and function. The County has wetland and surface water protective safeguards that are stronger than what is required by the State because our community has strong expectations for water resource protection and desire to maintain a quality of life that is dependent on a clean (and inexpensive) water supply.

Through the approval of the Alachua County Charter Amendment 1 on November 7, 2000, the voters of Alachua County elected to give the Board of County Commissioners the authority to establish countywide standards for protecting the environment by prohibiting or regulating air or water pollution. The County adopted Ordinance 18-05, known as the Countywide Wetland Protection Ordinance in January 2018, effectively expanding the protections of wetlands and associated buffers within both the unincorporated and municipal areas of the County. This ordinance created a new article (Article II) of Chapter 77 that set minimum requirements for wetland protection and buffer requirements. This approach is supported by the Comprehensive Plan's Intergovernmental Coordination Element Objective 8.1 and Policy 8.1.1.

<u>Outstanding Florida Waters</u>

An Outstanding Florida Water (OFW) is a water designated worthy of special protection because of its natural attributes. This special designation is applied by the State to certain waters and is intended to protect existing good water quality.

Most OFWs are areas managed by the state or federal government as parks, wildlife refuges, preserves, marine sanctuaries, estuarine research reserves, scenic and wild rivers, or aquatic preserves. Generally, the waters within these managed areas are OFWs because the managing agency has requested this special protection.

Waters that are not already in a state or federal managed area may be designated as "special water" OFWs if certain requirements are met, including a public process of designation. The designated OFWs in Alachua County are: Santa Fe River System, San Felasco Hammock State Preserve, Payne's Prairie State Preserve, Devil's Millhopper State Geological Site, Lochloosa Lake, and Orange Lake.

At a November 2016 public meeting, the Board of County Commissioners requested staff investigate the need for additional OFW protection requirements. This concern was raised again at the January 23, 2018 adoption hearing for Ordinance 18-05. At that meeting, staff was asked to consider increasing OFW buffer requirements from 150 ft. to 200 ft., consistent with the buffer distance the City of Gainesville requires for Payne's Prairie, a designated OFW.

Potential Strategies for Addressing the Issues

The County Charter and Comprehensive Plan already support the establishment of countywide standards for protecting the environment by prohibiting or regulating air or water pollution. However, the BOCC has requested staff investigate additional protection strategies for Outstanding Florida Waters (OFW) and staff will further investigate options available including increasing the buffer requirements in COSE Policy 3.6.8 that outline the default buffer requirements for all wetlands and surface waters, including OFWs.

PERMANENT PROTECTION

Board Item:

Issue: Permanent protection strategies for resources as part of the development review process (BOCC)

Introduction

Staff received direction from the BOCC on February 14, 2017 to look at existing permanent protection language in the land development code as it relates to temporary uses and other applications that do not fit well into existing code

requirements and procedures. The Alachua County Comprehensive Plan requires the protection of conservation areas (including wetlands and surface waters and their associated buffers), 100-year floodplains, significant geologic features, upland habitat areas, and strategic ecosystems as part of the development plan review process. The Unified Land Development Code, which implements the Comprehensive Plan, requires the permanent protection of conservation management areas that are identified through a natural resource assessment as part of a development plan application using a legal instrument that remains with the land (preferably a conservation easement that is conveyed to the County).

Current code language provides little flexibility related to the options available for permanent protection of regulated natural resources that are defined as 'Conservation Areas.' Broad changes in the strategies for protection of natural resources would require changes to the policies in the Comprehensive Plan. The goals, objectives, and policies relating to conservation areas and their protection are both interwoven among multiple parts of the Conservation and Open Space Element and integrated with other elements of the plan, especially the Future Land Use Element.

Changes to wetland mitigation strategies are limited to what is authorized under State regulations. The Unified Mitigation Assessment Methodology (UMAM), Chapter 62-345, Florida Administrative Code, is used in Florida to ensure consistency in mitigation statewide. Current Comprehensive Plan language is consistent with this requirement. Under State law there is little flexibility to go beyond what is currently provided in the Comprehensive Plan for applying wetland mitigation options.

Potential Strategies for Addressing the Issues

Because conservation protection requirements are interwoven throughout the Future Land Use Element and the Conservation and Open Space Element, staff will review these policies. A focus will be the language in Future Land Use Element Objective 6.2 (Rural/Agriculture) and Conservation and Open Space Element Objective 3.6 (Resource Protection Standards) policies that identify the requirements for protecting open space with a legal instrument that remains with the land, is recorded in the public record, and assures the preservation and continued maintenance of the open space.

AIR QUALITY

Advisory Board Item

Issue: Consider incentives for development/redevelopment that reduce air pollution and promotes clean air (EPAC): EPAC requested staff to look at the existing policies, specifically those related to refinements in urban density, traffic optimization, incentivized carpooling and greater use of public transportation, strategically placed sound barriers for particulate containment, and the planting of trees and shrubs for particulate uptake.

Introduction

Motor vehicles are one of the largest sources of air pollution in the United States. Physical characteristics and patterns of land development can affect air quality by influencing the availability of a variety of travel modes and ultimately which modes of travel people select.

Development patterns that locate jobs, housing, and recreation in close proximity increase the use of alternative forms of travel, such as walking, biking, and mass transit. Alternative forms of travel reduce the number of vehicles on the road, reduce the amount of pollution emitted by motor vehicles, and improve air quality.

Potential Strategies for Addressing the Issues

The policies in Conservation and Open Space Element Objective 4.1 (Air Resources) specifically address the issues raised by EPAC. Staff will evaluate the existing policies and, if appropriate, recommend changes.

COMPREHENSIVE PLAN POLICIES RELATING TO THE ISSUES

Future Land Use Element (FLUE)

FLUE Objective 1.6 – Traditional Neighborhood Developments
To provide for interconnected, mixed-use development through specific site and design standards that create pedestrian and bicycle friendly communities, reduce per capita greenhouse gas emissions and vehicular trips on external roadways and provide development patterns that are transit supportive.

Policy 1.6.6.6 Stormwater facilities shall be master planned. The location of surface stormwater facilities within the village center is discouraged. Surface stormwater facilities located in the village center should be designed in a park like manner serving as an amenity to the development. The use of Low Impact Development (LID) techniques are allowed and encouraged.

Policy 1.6.7.4 Street design standards shall address narrow pavement and right-of-way widths, turning radii, on-street parking, and other design criteria for roads, alleys and lanes. Standards shall promote walking and biking, ensure pedestrian and bicyclists safety, and allow for emergency and transit access. Urban green streets and Low Impact Development (LID) techniques are allowed and encouraged.

Objective 2.1 – General
Promote efficient use of land through designation of Activity Centers within the Urban Cluster which provide for nodes of higher density and intensity mixed uses that are interconnected with other commercial, employment, light industrial, and institutional centers within Alachua County through a system of multimodal corridors and a public transit system. Urban design standards for Activity Centers will provide for compact, mixed use, and pedestrian-friendly development, which is functionally integrated with surrounding land uses.

Policy 2.1.6 Activity Centers shall include a multimodal street network which provides interconnectivity of land uses within and surrounding the Activity Center.
(k) Street design standards shall be provided in the Land Development Code and shall address narrow pavement and right-of-way widths, turning radii, on-street parking, and other design criteria for roads, alleys and lanes, and Low Impact Development (LID) techniques for urban green streets. Standards shall promote walking and biking, ensure pedestrian and bicyclist safety, and allow for emergency and transit access.

Policy 2.1.8 Stormwater management facilities shall be sufficient to serve the functional purpose, and shall be designed as a public amenity that provides usable open space or an aesthetic feature that resembles natural areas. The use of shared stormwater facilities shall be evaluated as part of the development plan process, and utilized to the extent feasible. Low Impact Development (LID) techniques for stormwater management

shall be encouraged.

OBJECTIVE 6.2 - RURAL/AGRICULTURE
Areas identified for Rural/Agriculture on the Future Land Use Map are for agricultural activities including forestry and other agricultural uses, such as cattle grazing, cultivation of field crops, vegetable crops, dairies and those commercial or other uses on a limited scale serving or ancillary to agricultural activities, such as farm equipment and supplies, sales or service, farmers' markets, agritourism activities, composting, limited agricultural processing and wood product processing and wood manufacturing as provided in Policy 6.1.8 above, and agricultural products distribution. Rural residential uses, home-based businesses, rural event centers, heritage tourism and ecotourism activities, resource-based recreation and outdoor activity-based recreation are also allowed. Other uses involving animals not normally associated with agricultural activities, which would be suitable in the Rural/Agricultural areas, such as animal sanctuaries, kennels, and commercial animal raising, may be approved by the County Commission. New residential uses at a maximum density of one dwelling unit per five acres shall be permitted subject to the restrictions in Policy 6.2.7, except that the total allowable dwelling units may be increased pursuant to the Planned Development-Transfer of Development Rights program in accordance with 6.2.5.1 or the incentive bonuses for clustering of rural residential subdivisions in accordance with Policies 6.2.9 - 6.2.14.

Policy 6.2.5 Parcels containing natural resource areas as identified in the Conservation and Open Space Element shall be conserved in accordance with those policies, such that the natural functions of the resource area are not significantly altered. This shall be accomplished either through clustering of new developments in accordance with Policy 6.2.9 through 6.2.14 below, or for developments of less than 25 lots that might not be clustered in accordance with these policies, through a development plan that assures the permanent protection of natural resources consistent with the requirements of the Conservation and Open Space Element; the land development regulations shall detail the requirements for management and permanent protection of the ecological value of natural resources in those developments that are not clustered through legally enforceable mechanisms that provide protection of those resources equivalent to the protection under Policies 6.2.12.3 through 6.2.12.5.

Policy 6.2.12 Open Space Area in Clustered Subdivisions
A portion of a clustered rural residential subdivision shall be designated and maintained as undeveloped open space area.

(a) Percentage of site. Clustered Rural residential subdivisions shall designate a minimum of 50% of the site as open space area.

(b) Design Principles. Open space shall be selected and designed according to the following principles, consistent with Conservation and Open Space Element policies for the identification and protection of natural resources:

(1) Protect natural, historic, and paleontological resources and agricultural areas of the site identified through a site specific inventory.

a. Conservation areas shall receive top priority for inclusion as part of the designated open space area, and may only be impacted in accordance with Conservation and Open Space Element policies specific to the resource.

b. Agricultural areas with viable soils and effective land masses shall be included as part of the designated open space area after resource protection criteria are met. Agricultural uses are encouraged to be included as part of the designated open space area.

c. Historic and paleontological resources shall be included as part of the designated open space area when appropriate in accordance with the Historic Preservation Element.

(2) Design the open space area as a single contiguous area with logical, straightforward boundaries to eliminate or minimize fragmentation.

(3) Form linked open space networks with existing or potential open space areas on adjacent properties, other developments, or greenways, consistent with Conservation and Open Space Element Section 6.3.

(c) Permitted uses.

(1) Permitted uses in the open space area are natural resource conservation areas, non-intensive agriculture including community gardens, silviculture, and common open space, resource-based recreation uses which maintain the undeveloped area in a natural state, permeable stormwater facilities consistent with Stormwater Element Policy 5.1.11, community energy systems, and common water supply systems and common septic system drainfields. A residential unit used as a homestead just prior to the creation of the clustered subdivision can continue to be used as a homestead within the open space area and not counted toward the total number of units allowed in the rural clustered subdivision.

(2) More intensive agriculture uses such as concentrated animal density generally associated with milking barns, feed lots, chicken houses, or holding pens shall not be allowed in any clustered rural residential subdivision.

(d) Permanent protection. All future development in designated open space areas is prohibited.

(1) All open space shall be maintained and remain undeveloped in perpetuity using a legal instrument that runs with the land to set forth conditions and restrictions on use.

(2) All open space area and lots shall be restricted from further subdivision through an instrument in a form acceptable to the county and duly recorded in the public record which assures the preservation and continued maintenance of the open space.

(3) The boundaries of designated open space areas shall be clearly delineated on plans, including record plats, and marked in the field to distinguish these areas from developed areas.

(e) Ownership, maintenance, and management plan.

(1) Ownership methods. Ownership and maintenance of open space shall be by one or a combination of the following:

a. Original landowner

b. Homeowners association

c. Established land trust

d. Non-profit conservation organization

e. Alachua County, with county approval

f. Other public agency (e.g. Water Management District)

(2) Maintenance. Unless otherwise agreed by the County, the cost and responsibility of maintaining common facilities, including but not limited to open space, private roads, shared water systems, and stormwater systems, shall be borne by the owner(s) of the open space. If the open space is not properly maintained, the County may assume responsibility of maintenance and charge the property owner or homeowners association a fee which covers maintenance and administrative costs.

(3) Management plan. An open space management plan shall be required to accompany the development plan, subject to county review and approval. The management plan shall establish management objectives, outline procedures, and define the roles and responsibilities for managing the open space. Management shall include wildfire mitigation.

Conservation and Open Space Element (COSE)

COSE OBJECTIVE 3.6 Resource Protection Standards

Objective 3.6 - Resource Protection Standards
Protect natural resources by requiring that all development activities be conducted in accordance with at least minimum resource protection standards.

Policy 3.6.5 Development on land that includes conservation areas shall be sited and designed according to the following standards and consistent with policies under Objective 6.2 of the Future Land Use Element in the rural area:

(a) The preservation of conservation areas shall be required on all development sites to the greatest extent possible, consistent with standards which are outlined subsequently in this Element.

(b) Density or intensity shall be transferred from conservation areas to non-conservation portions of the property, to adjoining property under common ownership or management and within a unified development, or to other development receivership areas, at a rate consistent with that of the underlying zoning district, but not to exceed the maximum density allowed by the land use designation.

(c) When there are no non-conservation areas to which density or intensity may be transferred, the development shall be clustered in the portion of the site that will result in least environmental impact.

(d) When connection to central sewer is not required, septic wastes shall be disposed of according to the Comprehensive Plan, land development regulations, and health department standards, and without adversely affecting ecosystem health.

(e) Existing landscape connections to other conservation areas shall be maintained so that fragmentation is avoided.

Policy 3.6.8 Development occurring along the edges of conservation and preservation areas shall be designed to protect and minimize the impact of development on conservation areas through the use of natural vegetative buffers.

(a) Buffer width shall be determined on a case-by-case basis depending on what is demonstrated to be scientifically necessary to protect natural ecosystems from significant adverse impact. This determination shall be made in consideration of at least the following factors:

(1) Type of development and associated potential for adverse site-specific and off-site impacts;
(2) Natural community type and associated hydrologic or management requirements;
(3) Buffer area characteristics and function;
(4) Presence of listed species of plants and animals.

(b) Absent scientific information which demonstrates that a larger or smaller buffer width is appropriate, the following buffer widths shall apply for the resources set forth in the table below.

Protected Resource	Buffer Distance (feet)*
Surface waters and wetlands less than or equal to 0.5 acre that do not include OFWs or listed animal species as described elsewhere in this table	50 average, 35 minimum
Surface waters and wetlands greater than 0.5 acre that do not include OFWs or listed animal species as described elsewhere in this table	75 average, 50 minimum
Areas where federally and/or state regulated vertebrate wetland/aquatic dependent animal species have been documented within 300 feet of a surface water or wetland	100 average, 75 minimum
Outstanding Florida Waters (OFWs)	150 average, 100 minimum

* If the buffer precludes all economically viable use of a particular property, development may be allowed within the buffer in accordance with policy 3.6.5, and where applicable, policies 4.6.6 and 4.7.4.

(c) Buffers shall be measured from the outer edge of the protected resource.

Policy 3.6.14 Alachua County shall require mitigation of significant adverse impacts on conservation and preservation areas within the County. Mitigation shall include funding for the acquisition and management, preservation, replacement, or restoration of significant ecological resources.

Policy 3.6.15 The County shall identify and protect green infrastructure through the development review process by protecting conservation resources and natural areas and allow and encourage proven environmentally-friendly development techniques, like low impact development that minimize impacts to natural resources and water quality and maintain existing hydrologic conditions.

Objective 4.1 - Air Resources
Alachua County shall take appropriate steps to maintain or improve ambient air quality to ensure the protection of public health and the environment and to exceed compliance with state and national ambient air quality standards

Policy 4.1.5 Factors contributing to the maintenance or improvement of air quality shall be identified and considered during land use planning and development review. These factors include but are not limited to:

(a) Increased use of mass transit and non-motorized modes of transportation, and the promotion of a land development pattern conducive to support of public transportation, including containment of urban development in existing urban areas or carefully planned expansions of urban areas;

(b) Increased use of green space in site planning for all types of development and along major roadways; and

(c) Increased strategic planting of trees and shrubs to shade streets and buildings, reducing energy consumption and new carbon dioxide generation caused by combustion of fossil fuels; and

(d) Control of airborne dust generated from land clearing and site preparation activities. Control may involve the use of techniques such as temporary silt fencing, immediate seeding or sodding, permanent vegetative buffering, phasing land clearing with development, or sprinkling the area with water.

(e) Promotion of industries that exceed Federal and State air quality and emission

standards.

Policy 4.1.6 The County shall pursue and support programs that reduce adverse impacts on air quality due to traffic emissions by encouraging use of public transit, multiple ridership in automobiles, and safe use of bikeways.

Policy 4.1.8 The County shall establish a tree planting program to improve air quality in designated areas.

Policy 4.1.9 The County shall establish an intergovernmental task force, comprised minimally of representatives from local governments and utilities, to coordinate on air quality issues such as alternative fuels and the use of hybrid fuel vehicles.

Objective 4.4 - Geological Resources
Protect and maintain significant natural geologic features such as special karst features -- springs, caves and sinkholes in their natural condition.

Policy 4.4.7 The County shall establish management strategies for sinkholes and sinkhole-prone areas that protect water quality, hydrologic integrity, and ecological value. Management strategies may include, among other techniques, filling and development restrictions, buffers, runoff diversion, muck and debris removal, berm and weir construction, and filtration.

Objective 4.5 Groundwater and Springs
Protect and conserve the quality and quantity of groundwater and springs resources to ensure long-term public health and safety, potable water supplies from surficial, intermediate, and Floridan aquifers, adequate flow to springs, and the ecological integrity of natural resources.

Policy 4.5.1 The County shall establish a comprehensive wellhead protection program to protect current and future public water supply needs from potential adverse effects from incompatible land uses and activities.

(a) Wellfield protection areas shall be identified surrounding each public potable water supply well or wellfield in the County.
(b) The latest scientific modeling shall be reviewed and, as necessary, updated to assist in the identification of wellfield protection areas.
(c) For each wellfield protection area, the land development regulations shall specify the size, location, and applicable restrictions of protection zones, including restrictions on activities associated with hazardous materials, septic tanks, and well construction, modification and closure.
(d) New well construction shall be regulated and inspected to ensure that wells are properly constructed and properly closed and sealed when no longer in use.
(e) The County shall assist the WMDs and the municipalities with environmental suitability analysis for expansion of existing wellfields or location of future wellfield

areas.

Policy 4.5.2 Until wellfield protection areas are established for each public water supply well, the following standards shall apply in the areas surrounding such wells:

(a) Each public water supply well shall be protected by a 200 foot zone of exclusion within which no new development approvals will be granted, as provided in Policy 3.6.8.

(b) The following new uses or expansions of existing uses shall be prohibited in the vicinity of each public water supply well as specified in the Alachua County Hazardous Materials Management Code:

(1) Class C or D facilities as defined by the Alachua County Hazardous Materials Management Code.

(c) The following new uses or expansions of existing uses shall be prohibited in the vicinity of public water supply wells:

(1) Landfills;

(2) Feedlots or other commercial animal facilities;

(3) Wastewater treatment plants and percolation ponds, including wastewater reuse and discharge facilities;

(4) Mines;

(5) Excavation of waterways or stormwater management facilities which intersect the water table;

(6) Stormwater retention and detention basins except pursuant to performance controls where configuration or topography of a lot of record precludes location of a required retention or detention basin outside the Wellfield Protection Area; and

(7) All uses prohibited in High Aquifer Recharge Areas by Policy 4.5.5(e), below.

Policy 4.5.3 The County adopts the Alachua County Floridan Aquifer High Recharge Area map. This map is for information and outreach purposes and provides a generalized indication/depiction of relative aquifer recharge/vulnerability and high aquifer recharge areas as general background to be used in combination with site-specific hydrogeologic assessment for development review in the unincorporated portion of the County.

Policy 4.5.4 The County shall consider an ordinance creating a high-water recharge protection tax assessment, or bluebelt, program to encourage protection of high aquifer recharge areas. This voluntary program would offer a tax reduction to property owners who agree to use their property only for bona fide high-water recharge purposes, as provided in Section 193.625, Florida Statutes. The Alachua County Floridan Aquifer High Recharge Area map delineates high-water recharge areas for use in connection with such an ordinance which shall be coordinated with Suwannee and St Johns River Water Management Districts in accordance with Section 193.625, Florida Statutes.

Policy 4.5.5 Appropriate local planning, development design standards, and special

construction practices shall be required to ensure both short and long-term mitigation of impacts on groundwater created by activities occurring in high aquifer recharge areas. The following provisions shall apply:

(a) All new development or modifications to existing development shall provide stormwater treatment consistent with the Stormwater Element of the Comprehensive Plan.

(b) All stormwater basins in high aquifer recharge areas shall be designed and constructed to provide for at least three (3) feet of unconsolidated solid materials such as sand, silts, and clays between the surface of limestone bedrock and the bottom and sides of the stormwater basin. Utility lines shall not be installed beneath stormwater basins in karst sensitive areas. Any lines for temporary irrigation of vegetation in and around stormwater management systems shall be installed to minimize excavation in karst sensitive areas.

(c) Corrective action to retrofit or upgrade existing hazardous material facilities consistent with standards applicable to new facilities shall be required by the County.

(d) New development activities which involve handling or storing of hazardous materials may be prohibited in high aquifer recharge areas, and, where permitted, shall be subject to the general requirements, siting prohibitions, storage facility standards, secondary containment requirements, and monitoring provisions of the Hazardous Materials Management Code. Where such facilities exist and are proposed to be modified, development review and permitting activities shall include careful evaluation and implementation of engineering and management controls, setbacks and buffers, and monitoring. Existing facilities shall meet the requirements of the Hazardous Materials Management Code pertaining to such facilities.

(e) The following new uses shall be prohibited in unincorporated areas of Alachua County designated as the high vulnerability zone of the Alachua County Floridan Aquifer High Recharge Area map, unless it can be demonstrated that the material, in the quantity and/or solution stored or the conditions under which it is to be stored, does not pose a hazard to human health or the environment:

(1) Wholesale bulk fuel storage;
(2) Chemical manufacturing;
(3) Pesticide manufacturing;
(4) Auto salvage or junk yard;
(5) Asphalt plant;
(6) Battery reclamation or manufacturing;
(7) Electronics manufacturing using halogenated solvents;
(8) Any hazardous waste transfer site;
(9) Any site defined by the Resource Conservation and Recovery Act (RCRA) as a treatment, storage, or disposal (TSD) facility for hazardous waste;
(10) Regional pesticide distribution site;
(11) Underground storage tank for the storage of hazardous materials; and
(12) Portland cement manufacturing.

(f) Limitations on package treatment plants and septic systems are as follows:

(1) Package treatment plants shall not be allowed in areas served by

centralized wastewater treatment plants. The use of new package treatment plants is discouraged, and may be considered outside the urban cluster only in accordance with Policy 2.1.6 of the Potable Water and Sanitary Sewer Element.

(2) New development not connected to central sanitary sewer shall be limited to a minimum lot size of one (1) acre to prevent degradation of groundwater quality unless the applicant can demonstrate that smaller lot sizes and associated sanitary systems will cause no degradation of groundwater quality.

(g) The Alachua County Hazardous Materials Management Code provides the following measures towards the protection of natural resources:

(1) Regulates hazardous materials to prevent discharges to the environment in the County.

(2) Provides uniform standards for the proper storage, handling, and monitoring of hazardous materials on a county-wide basis.

(3) Provides for early detection, containment, and recovery of discharges.

(4) Establishes a cost recovery mechanism to pay for hazardous materials emergency response actions performed by the Environmental Protection Department.

(5) Provides Alachua County with legal authority to establish environmental monitoring, remediation, and closure requirements for contaminated sites: and,

(6) Disallows the construction of new storage tank systems within three hundred (300) feet of an existing private water supply utility well, or within one thousand (1000) feet of an existing public water supply well.

Policy 4.5.6 Appropriate development regulations shall be established to control land uses and activities in proximity to wellfields and designated High Aquifer Recharge Areas. These controls will be based at a minimum upon:

(a) The potential of the land use or activity to contaminate groundwater;

(b) Distance from a public wellfield;

(c) Local aquifer geology; and

(d) The capability of the activity to contain or eliminate the hazard of contamination.

These regulations shall control activities involving fuel storage tanks, hazardous waste generators and hazardous material users, private wells, waste water treatment systems, landfilling operations, dairies or other uses with a high potential for ground water contamination. Interim control of activities shall be through the development review Committee process and shall be consistent, at a minimum, with the Hazardous Materials Management Code.

Policy 4.5.7 The land development regulations shall be reviewed and revised, if necessary, to ensure that groundwater is adequately protected.

Policy 4.5.8 Applicants for new development or additions to existing development shall address potential groundwater quality impacts. Development applications shall be denied if they are insufficiently protective of groundwater quality.

Policy 4.5.9 In accordance with Florida Statutes for Water Supply Planning, the County shall cooperate with the St. Johns River and Suwannee River Water Management Districts in the evaluation of updates of applicable data and analysis of current and projected water needs for at least a 10-year period; initiate Comprehensive Plan amendments to incorporate appropriate water supply projects, including conservation and reuse projects, identified in regional water supply plans; and coordinate WMD updates of the water supply plans and County comprehensive plan amendments with Gainesville Regional Utilities.

Policy 4.5.10 Withdrawals of ground water have the potential to result in adverse impacts on potable water supply and natural ecosystems. Development shall occur only when adequate water supplies are concurrently available to serve such development without adversely affecting local or regional water sources or the natural ecosystem, as determined in accordance with local and state law.

(a) The County shall take an active role in providing input to the water management districts permitting process for activities that use large volumes of groundwater.
(b) The County shall support the efforts of the Alachua County Health Department to seek delegation of water well construction permitting responsibility from both the St. Johns River and Suwannee River Water Management Districts to ensure that all new wells are properly constructed, modified, sealed or abandoned.

Policy 4.5.11 The County shall encourage the development of local and regional water supplies within water management districts through the following strategies

(a) Participating in the development of the water supply assessments, regional water supply plans, and five year work plans of the Suwannee River and St. Johns River Water Management Districts;
(b) Requesting to receive water management district notice of any consumptive use applications that involve the transfer of water, where that transfer originates within the jurisdictional boundaries of the County and advocating for water conservation and reuse, and the development of alternate supply sources (such as desalinization) by such applicants;
(c) Considering the establishment of a regional water supply authority; and
(d) Amending existing legislation regarding consumptive use permitting and exercising vigilance through the County's legislative delegation.

Policy 4.5.12 The County shall cooperate with the Suwannee River Water Management District, the St. Johns River Water Management District, and local governments to conduct current and future water conservation programs and prepare an emergency water management conservation plan.

Policy 4.5.13 A County-wide groundwater monitoring program shall be developed and funded to coordinate and expand upon existing groundwater monitoring efforts. This program shall include monitoring of springs.

Policy 4.5.14 Groundwaters shall be monitored throughout the County to provide ambient quantity and quality information. Contaminated sites shall be identified and groundwater in these areas shall be monitored by the responsible party for the purpose of providing water quality and hydrogeologic information to the County. This information shall be used by the County to determine and require the implementation of appropriate corrective or protective action. The development regulations shall specify the measures necessary to protect the groundwater and remediate contaminated groundwater. The measures to be required shall be determined by the activity's potential for groundwater contamination and the vulnerability of the area to groundwater contamination. The regulations shall, at a minimum, address:

(a) Method(s) of assessing contamination risk.

(b) Types of controls to abate the risk. Methods may include, but are not limited to, stringent engineering controls, limited densities, setback requirements, buffers, restricted uses, types of leak detection, operating procedures, and types of primary and secondary containment.

(c) Monitoring activities which verify the success of the controls. It shall be the responsibility of the facility or activity to pay the costs of the monitoring activities.

Applicable interim standards shall be consistent, at a minimum, with federal, state, and water management regulations in effect at the time of adoption of the Comprehensive Plan.

Policy 4.5.15 Abandoned installations or facilities shall be properly deactivated, with contaminants properly disposed. Leaking underground storage tanks shall be promptly taken out of service and repaired. Abandoned underground storage tanks shall be removed, unless removal would threaten the structural integrity of a nearby building or other structure. In such cases where in-place abandonment is necessary, the tanks shall be abandoned in-place by removing all hazardous materials, cleaning the tank, and filling with an appropriate inert substance. The development regulations shall specify proper procedures for the various types of materials and installations and shall address methods of assessing and recovering the costs of the activity. Abandoned wells shall be sealed. The County shall evaluate the feasibility of locating and regulating all drainage wells in Alachua County. Interim applicable standards shall, at a minimum, be consistent with federal, state, local, and water management district regulations in effect at the time of adoption of the Comprehensive Plan.

Policy 4.5.16 Existing installations or facilities that have the potential for significant contamination of ground waters shall be retrofitted or replaced with leak detection, secondary containment, and environmental monitoring. Ground waters that may be significantly and adversely affected by new installations, facilities, or other development activities shall be protected by stringent engineering controls, limited development densities and/or use restrictions, and monitoring. The development regulations shall specify the engineering controls, setback requirements, buffers, appropriate densities, use restrictions, and monitoring to implement this policy. This policy is implemented

through the provisions of the County's Hazardous Materials Management Code.

Policy 4.5.17 Approval of development or redevelopment of a contaminated site shall be withheld until the applicant demonstrates to the County's satisfaction that contamination will not be exacerbated by the activity.

Policy 4.5.18 Old garbage disposal areas, illegal dumps, other waste sites where groundwater contamination has been determined to exist, and such other sites that may potentially contain contaminants that threaten groundwater resources shall be evaluated and appropriate cleanup activities identified and implemented. When the responsible party for the site is known, such person or persons shall assume the costs of the evaluation, monitoring and cleanup measures.

Policy 4.5.19 Disposal of effluents of wastewater treatment processes shall be accomplished by environmentally sound procedures consistent with FDEP regulations which may include land application, deep well injection, and reuse or wetlands disposal. New deep well injection shall be prohibited except for the return of non-contact water from residential and commercial heat pumps, and injection of "high-quality" treated water and for the purpose of aquifer storage and recovery. Expansion or renewal of existing deep well injection operations shall require a special use permit through which monitoring conditions will be established. All new wastewater treatment plants in high aquifer recharge areas shall provide advanced treatment including nutrient removal prior to discharge. All existing wastewater treatment plants in high aquifer recharge areas shall be encouraged to upgrade to provide for advanced treatment. Alachua County shall emphasize the reuse of water where economically feasible. High rates of infiltration shall not be permitted in high aquifer recharge areas unless the effluent has received advanced treatment and nutrient removal and the wastewater treatment plant has been built and is being operated according to DEP Class I reliability standards.

Policy 4.5.20 The County shall encourage the redevelopment of brownfields consistent with protection of human health and natural resources.

Policy 4.5.21 The County shall continue to promote water conservation techniques and programs for current and future development (consistent with Energy Element Objective 1.1). The County shall support water conservation practices and standards, including but not limited to, Florida Water Star SM, Florida Friendly Landscaping, LID techniques, installation of water efficient fixtures, soil moisture sensors and smart irrigation systems, and landscape irrigation restrictions.

(a) The County shall update its landscape code to require a reduction in irrigated areas for all new residential and commercial development.

(b) Indoor and outdoor use of water should, at a minimum, meet or exceed Florida Water Star SM criteria (goal of 40% reduction in outdoor water use and 20% reduction in indoor water use) or the equivalent intended to provide water-efficient options for homes and landscapes. The County will coordinate with potable water

suppliers to develop an incentive, education and outreach program that encourages participation in water conservation programs such as Florida Water Star SM.
(c) The County shall develop measures that promote water conservation to preserve groundwater levels that retain adequate spring discharge from the Floridan aquifer springs along the Santa Fe River with the objective of no net loss in biological, ecological, and hydrological function.
(d) The County shall lead by example in the area of water conservation by reducing indoor and outdoor water use at all County facilities with a goal of meeting Florida Water StarSM commercial criteria by 2015.
(e) The County shall encourage the public and private water suppliers in the County to implement aggressive but fair water conservation pricing rate structures.

Policy 4.5.22 The County shall establish a comprehensive springshed protection program to protect the resource from potential adverse effects from incompatible land uses and activities.

(a) Springshed protection areas shall be identified for all springs in the County; springsheds within the County that extend from springs located outside the County shall also be identified.

(b) The latest scientific modeling shall be reviewed and, as necessary, updated to assist in the identification of springshed, springs, and Floridan aquifer high recharge areas.

(c) For these springs and groundwater protection areas, land development regulations shall specify the size, location, and applicable requirements of protection zones, including specific requirements on activities associated with domestic waste treatment including septic tanks, package plants, and regional wastewater treatment facilities and their effluent disposal practices.

(d) Fertilizer shall be regulated to ensure that excess nitrogen and phosphorus are not leached into the Floridan aquifer.

(e) The County shall provide municipalities with current modeling and protection standards for their use in protecting these resources.

(f) The following new uses or expansions of existing uses shall be prohibited in designated springsheds, springs buffers, and Floridan aquifer high recharge areas:

(1) Rapid infiltration basins (RIBs) for wastewater effluent disposal.

(2) New or expanded surface water discharge of treated wastewater.

(3) Large scale land application of Class A or B biosolids.

(4) Land application of septage.

(g) The County shall develop effluent discharge standards for new and existing wastewater treatment plants in springshed protection areas for inclusion in the Land Development Code.

(h) Reclaimed water standards in Policy 4.6.16 item (d) shall apply.

OBJECTIVE 4.6 - SURFACE WATER SYSTEMS
Ensure the protection and improvement of the water quality, biological health, and natural functions of surface water systems in Alachua County.

Policy 4.6.1 Water quality standards for Class III surface waters shall be used as minimum criteria for maintenance of water quality in Alachua County, unless a water body is specifically exempted as a Class IV surface water.

Policy 4.6.2 Alachua County shall promote recovery to water quality standards by identifying significant point and non-point sources of water pollution, and acting to reduce the harmful impacts of these pollutants on the natural environment.
Policy 4.6.3 Biodiversity shall be used as a measure of the biological health of surface water systems. Alachua County shall strive to maintain the biodiversity and habitat diversity of its surface water systems.

Policy 4.6.4 The natural hydrologic character and function of surface waters, including natural hydroperiods, flows found in floodways, flows that connect wetlands with other wetlands and surface waters, and wildlife habitat and connectivity, shall be protected. Land development regulations shall specify criteria for site design including limits on and mitigation for filling and excavation. In addition, the County shall establish an appropriate review and approval process that provides for regulation of water control structures including but not limited to indirect impacts from land development activities.

Policy 4.6.5 All surface water systems in the County shall continue to be protected by buffer widths established in Policy 3.6.8.

Policy 4.6.6 The following activities may be allowed within the buffer subject to standards that regulate environmental impacts:
(a) Agricultural and silvicultural operations consistent with Objective 5.5;
(b) Water dependent facilities;
(c) Minimal impact activities;
(d) Activities that serve the overriding public interest; and
(e) Development allowed through implementation of Policy 3.6.5(c), provided that the development impact area shall not exceed the rate of one-half (1/2) acre per ten acres of conservation area, including the footprint of principal and accessory structures and parking, allowing for reasonable access.

Policy 4.6.7 The clearing of shorelines and riparian wetlands for viewsheds, sand beaches, access, and similar purposes shall be prohibited, except when clearing constitutes a minimal impact activity.

Policy 4.6.8 Native vegetation that occurs in natural surface waters, buffers, and natural floodways shall be retained in its natural state. Harvesting, cutting, and clearing activities shall be restricted except to remove non-native species or as part of good vegetative management, including legitimate silvicultural activities consistent with Objective 5.5, or to protect public health, safety, and welfare.

Policy 4.6.9 Chemical control of aquatic weeds, non-native species, animal pests, insect pests, or undesirable fish shall be performed as specified under State and Federal Law, such that degradation of surface water quality will be minimized consistent with the protection of the health of the public and wildlife. The use of safe biological and mechanical controls shall be encouraged. Any such activity shall be conducted to maintain natural ecosystems and to achieve sound resource management and public health objectives consistent with all applicable regulations.

Policy 4.6.10 The County shall maintain a local surface water monitoring program dually focused on water quality and biological health.

(a) Monitoring shall be conducted to determine baseline water quality and biological health, as well as to establish trends.

(b) Water quality indicators to be monitored include field parameters, flow, general physical parameters, selected major ions, nutrients and bacteria.

(c) Biological health shall be determined by conducting habitat assessments and collecting macro invertebrate samples.

(d) Monitoring shall be performed by the Alachua County Environmental Protection Department, in cooperation with the Florida Department of Environmental Protection, applicable Water Management Districts and local municipalities.

(e) The County shall adjust its sampling locations, parameters, and frequency to maximize county-wide coverage while minimizing duplication of sampling efforts by other entities. Locations shall include mining pits and sinkholes.

(f) Alachua County shall continue to seek funding from the Water Management Districts, state, federal, and other appropriate entities for surface water quality and biological monitoring purposes.

(g) Subject to available funding, implement a volunteer water quality monitoring program.

Policy 4.6.11 Alachua County shall publish a reader-friendly status report that describes the following conditions of each watershed:

(a) Physical habitat;

(b) Biology;

(c) Pollution sources;

(d) Water quality;

(e) Erosion and sedimentation; and

(f) Ecosystem health.

Policy 4.6.12 Alachua County shall continue to participate in multi-agency task forces and working groups established to address specific surface water quality concerns in the County. Alachua County shall continue to work towards the restoration of impaired water bodies and to meet Total Maximum Daily Loads (TMDL) in the County.
Policy 4.6.13 Alachua County shall continue to coordinate with the water management districts on activities in the Orange Creek and Santa Fe River basins. Alachua County shall continue to work with the water management districts toward meeting Minimum Flows and Levels (MFLs) as established by the districts.

Policy 4.6.14 Alachua County shall encourage and contribute to watershed management as well as creek and river cleanups.

Policy 4.6.15 There shall be no direct or indirect discharge of pollutants to surface waters, ground waters, or sinkholes in violation of federal, state, Water Management District, or local water quality standards.
Policy 4.6.16 Land uses that have the potential to pollute surface waters (are located adjacent to surface waters and that contribute significant nutrient loadings) shall be identified and regulated using the following measures to protect water quality and biological health.
(a) Buffers to surface waters shall be increased for activities which have been associated with surface water quality and biological health problems such as landfills, composting facilities, wastewater treatment percolation ponds or rapid infiltration basins (RIBs), spray fields, golf courses, dairies, row crops, septage or biosolids land application sites, septage stabilization facilities, and onsite sewage treatment systems or septic systems.
(b) The implementation of best management practices shall be required in buffers to surface waters to control nutrient loadings, including retrofitting if needed to maintain water quality and biological health.
(c) The use of pesticides and fertilizers shall be discouraged in buffers.
(d) The use of reclaimed water shall be regulated to conform with environmentally sound practices and not allowed to adversely impact surface water or groundwater by increasing nutrient concentrations. Nutrients present in the reclaimed water shall not be discharged in a manner that will cause impairment of surface waters, cause an imbalance of flora and fauna in the aquatic ecosystem, or cause eutrophication of the receiving waters. Land development regulations shall be adopted that include setbacks to surface waters for the use of reclaimed water for irrigation that are protective of the aquatic ecosystem.
(e) All fill material used onsite shall be free of phosphatic Hawthorn Group sediments or other phosphorous rich materials that may leach phosphorus causing surface water quality degradation and lake eutrophication.
(f) Any excavation that would lead to exposure of Hawthorn Group sediments or other phosphorus rich materials that could leach and adversely impact groundwater or

surface water shall be mitigated by covering, backfilling or using other techniques to reduce phosphorus leaching.
(g) Fertilizer shall be regulated in buffers to surface waters to ensure that excess nitrogen and phosphorus are not leached into surface water bodies causing water quality degradation and/or lake eutrophication.
(h) The use of performance based treatment systems may be required in highly sensitive areas, such as in proximity to Outstanding Florida Waters, impaired waters, in springsheds where karst features are prominent and conduit flow is known to exist, or where the lot sizes are small and do not allow for adequate nutrient reduction to be met at the property boundary. These systems shall be designed and permitted under a defined performance standard criterion (e.g. Secondary or Advanced Secondary treatment standards). This measurable performance standard can be adopted as a risk based mitigation strategy for site specific concerns.

Policy 4.6.17 Wastewater and stormwater discharges to surface waters and wetlands shall be allowed only if the following criteria are satisfied:
(a) The quantity, timing, and quality of the discharge maintain or improve water quality, biological health, and the function of the natural ecosystem.
(b) Downstream waters are not affected by nutrient loading.
(c) The project owner or developer prepares and implements maintenance and monitoring plan acceptable to the County.
(d) The project owner or developer corrects any failures in design or operation of the system that cause degradation of water quality, biological health, or the function of the natural ecosystem.
(e) The owner or developer posts a performance bond or similar financial guarantee to assure implementation of the maintenance and monitoring plan.

Policy 4.6.18 Wastewater treatment facilities shall be planned and constructed at a scale that is compatible with the natural hydroperiod and the assimilative and hydraulic loading capacities of receiving surface waters and associated wetlands. The use of alternative technologies that are more protective of water quality, biological health, and the function of the natural ecosystem shall be encouraged.
Policy 4.6.19 Alachua County shall prohibit the use of wastewater treatment plants and septic tanks in flood prone areas.

Policy 4.6.20 The County shall monitor emerging state-of-the-art wastewater and stormwater treatment technology and shall cooperate with Water Management Districts, state and local agencies to ensure that water quality objectives are met through the most appropriate and effective methodologies.

Policy 4.6.21 Retrofitting where practicable of substandard stormwater management systems shall be required during repair, expansion, or redevelopment activities. This policy is intended to address water quality and biological health problems resulting from the absence of stormwater management systems, as well as obsolete, inadequately

designed or improperly maintained systems. Where retrofit occurs, protection of water quality, biological health, and the function of the natural ecosystem shall be required.

Policy 4.6.22 The development of stormwater management systems across or for multiple properties and for multi-purpose use shall be encouraged.

Policy 4.6.23 The County shall coordinate with the Water Management Districts and applicable local, state and federal agencies on the evaluation of existing surface water control structures, such as, but not limited to, those on Orange Creek and Prairie Creek, for their economic benefits and impact on lake and wetland ecosystems.

Policy 4.6.24 Where past modifications have been made and restoration of original natural flows would be beneficial to water management and wildlife needs, consistent with development needs and good site design practices, restoration shall be encouraged and may be required prior to development approval. The County shall include standards in the development regulations that will evaluate the feasibility of restoration on a case-by-case basis.

OBJECTIVE 4.7 - WETLAND ECOSYSTEMS
Wetland acreage and function shall be protected.

Policy 4.7.1 Wetlands of all sizes shall be regulated without exception.

Policy 4.7.2 Alachua County shall utilize the uniform statewide methodology adopted by the Florida Department of Environmental Protection and Water Management Districts to delineate wetlands, as outlined in Rule 62-340, Florida Administrative Code, as the rule exists on January 1, 2001. The County shall not be limited by the threshold or connection requirements utilized by these agencies for purposes other than delineation.

Policy 4.7.3 Wetland ecosystems shall be protected by buffer widths established in Policy 3.6.8.

Policy 4.7.4 Development activity shall not be authorized in wetlands or wetland buffers except when all of the following conditions are met:

(a) The applicant has taken every reasonable step to avoid adverse impact to the wetland and buffer; and

(b) The applicant has taken every reasonable step to minimize adverse impact to the wetland and buffer; and

(c) The applicant has provided appropriate mitigation for adverse impact to the wetland and buffer; and

(d) The applicant shows that one of the following circumstances applies:

(1) Minimal impact activity; or

(2) Overriding public interest; or

(3) All economically beneficial or productive use of the property is otherwise precluded.

The development impact area shall not exceed the rate of one-half (½) acre per ten acres of conservation area, including the footprint of principal and accessory structures and parking, allowing for reasonable access. Notwithstanding the above, mitigated impact may be allowed to any isolated poor quality wetland that is less than 0.25 acre in size, provided the total impact area is not greater than or equal to 0.25 acre per development. Poor quality shall be defined in the land development regulations based on factors relative to ecological value.

Policy 4.7.7 Any development activity permitted within an onsite, or affecting an offsite, wetland or buffer shall be mitigated at the expense of the landowner. Mitigation proposals shall be submitted to the BoCC for review in the form of a mitigation and monitoring plan, according to a natural resources permit process to be articulated in the land development regulations. Final Board of County Commissioners approval of a mitigation and monitoring plan must be received prior to wetland or buffer alteration. The Land Development Regulations shall authorize that the Board of County Commissioners shall approve, deny or approve with conditions any natural resources permit. In order to be considered, the mitigation and monitoring plan must ensure the long term viability of the mitigation project, advance the County's natural resources conservation objectives and policies, and meet the following minimum guidelines:

(a) Mitigation shall include any one or a combination of: monetary compensation, or acquisition, restoration, enhancement, or preservation of wetlands, other surface waters or uplands.

(b) Preservation shall not be considered when protection of the resource proposed for preservation is already ensured by federal, state, water management district, or local regulations.

(c) Mitigation shall be determined by applying the Uniform Mitigation Assessment Method (UMAM), pursuant to Chapter 62-345, F.A.C.

(d) Mitigation shall be permitted only within the boundaries of Alachua County and, to the maximum extent practicable, within the local watershed in which the impact occurs.

(e) Alachua County shall prioritize receiving areas for mitigation within the county, and investigate the feasibility of implementing a local mitigation banking system.

(f) Wetland mitigation activity conducted by a public agency may not be utilized for wetland mitigation credit by private persons unless approved by Alachua County.

(g) The landowner shall post a performance bond or similar financial guarantee to assure implementation of the mitigation and monitoring plan.

(h) No mitigation credits will be given for onsite preservation of wetlands.

Objective 5.2 - Open Space

Preserve open space within developments to ensure public health, safety, and welfare; protect and enhance natural resources; provide public gathering spaces; promote

pedestrian and bicycle connectivity; and enhance recreational opportunities.

Policy 5.2.1 Natural features such as steep slopes, ridges, sinkhole areas, floodplains, and other unsuitable areas for urban development shall be retained as open space areas. If appropriate, these areas shall be developed for use as trails, and where possible, used to connect other recreation and open space areas and other developments.

Potable Water and Sanitary Sewer Element (PWSSE)

PWSSE OBJECTIVE 6.1 The County shall encourage wastewater effluent reuse and other incentives for the maximum utilization of reclaimed water to the greatest extent possible by facilitating the approval of environmentally-sound facilities.

PWSSE Objective 8.1 To promote the increased conservation and reuse of water.

Policy 8.1.1 Alachua County shall promote public information programs in an effort to increase public awareness and acceptance of water conservation techniques through newsletters, public service announcements, and displays at public awareness events.

Policy 8.1.2 Land Development Regulations shall provide for the use of cluster development and attached dwelling units and zero lot line arrangements and smaller lot sizes. Such development patterns shall be encouraged during the County's Development Review Committee (DRC), until the land development regulations include provisions to implement this policy.

Policy 8.1.3 Development plans shall be reviewed for inclusion of native vegetation and other low water demand landscape material in order to reduce outdoor water consumption

Policy 8.1.4 Restrictions established by applicable water management districts or water districts shall be adhered to. The County or other government organization shall enforce these restrictions. Alachua County shall also encourage largescale commercial and institutional users of outdoor water to utilize early morning consumption as part of its public awareness efforts.

Policy 8.1.5 The County will make available lists of vegetation classified by water demand for use by residents and developers as part of the public awareness efforts of the County.

Policy 8.1.6 Low-volume plumbing devices shall continue to be required, consistent with local building codes.

Policy 8.1.7 The County shall encourage the use of stormwater runoff for irrigation, agricultural or industrial water needs in order to conserve potable water sources. By 2002, Alachua County shall complete a study of alternative technologies for consideration in revising the land development regulations.

Stormwater Element

Objective 5.1 Alachua County will ensure the protection of natural drainage features, including surface water quality and groundwater aquifer quality and quantity recharge functions, from stormwater runoff.

Policy 5.1.5 All new development, redevelopment, and, when expansion occurs, existing developed areas with a stormwater discharge to an active sinkhole shall provide a minimum treatment of the runoff from the first two (2) inches of rainfall from the design storm.

Policy 5.1.11 Stormwater management facilities shall utilize contours of the site and minimize disturbance to existing natural features to maximum extent feasible. The county shall develop land development regulations that incentivize, encourage, and require where necessary, environmentally sensitive approaches to stormwater management, including Low Impact Development (LID) techniques and the protection of natural areas and features.

Policy 5.1.12 The proportion of the area of stormwater management facilities to the area of the site shall be limited to the maximum extent practicable through LID techniques, the reduction of impervious surfaces via vertical construction and the use of alternative parking surfaces in order to preserve the existing pre-development hydro-period from discharge to wetland systems and adequate existing vegetation on the site.

Energy Element

Objective 1.1 Reduce countywide greenhouse gas (GHG) emissions by 80% from 2009 baseline emissions by 2050, with an intermediate goal of a 40% reduction by 2020 and a short term goal of 5% annual reduction.

Policy 1.1.3 As water conservation contributes to the reduction of greenhouse gas emissions, reduce total water consumption in Alachua County by 10% from 2010 levels by 2020 through the policies of the Conservation and Open Space and Potable Water and Sanitary Sewer Elements. In addition to changes in total consumption, the County, in coordination with potable water suppliers, shall track and report on indicators of improvements in efficiency such as rates of participation in voluntary conservation programs like Florida Water StarSM, reductions in potable water use per capita,

increased use of reclaimed water for irrigation purposes, or other similar measures.

Objective 3.2
The County shall encourage long-term carbon sequestration practices on both public and private land.

Policy 3.2.3 Promote and provide incentives for the use of Low Impact Development strategies in new developments to protect natural ecosystems in accordance with Policies 5.11 and 5.12 of the Stormwater Management Element and Policies 3.6.15 and 4.5.21 of the Conservation and Open Space Element.

Intergovernmental Coordination Element

Objective 8.1 Coordinate the protection of the environment.

Policy 8.1.1 Alachua County shall coordinate the environmental protection of land, air, and water with the appropriate agencies and jurisdictions for the benefit of people, wildlife, and plants.

(a) The County shall coordinate with the Countywide Visioning and Planning Committee or similar entity, Non-governmental organizations, State, federal municipal and adjacent counties to extend ecologically functional linkages between ecological core areas on the Critical Ecological Corridors Map in accordance with Policy 6.3.2 of the Conservation and Open Space Element.

(b) The County shall pursue development of an interdisciplinary team to address protection of strategic ecosystems and other natural resources within each city's reserve area.

(c) The County shall encourage establishing a subcommittee of the Countywide Visioning and Planning Committee (CVPC) or similar entity to implement relevant guiding principles and action strategies in the CVPC Conceptual Plan Objectives to protect natural resources countywide. Such a subcommittee shall consider inclusion of environmental analysis and environmental protection standards/requirements in the Boundary Adjustment Act (BAA) or related interlocal agreements.