5.0 CONSERVATION

Blank Page

UNIVERSITY OF CENTRAL FLORIDA

5.0 CONSERVATION

2025-35 CAMPUS MASTER PLAN UPDATE

CONTENTS

5.0 CONSERVATION

Blank Page

5.0 CONSERVATION

5.1 INTRODUCTION

STATUTE & REGULATION

The CONSERVATION element is required by Florida Statue 1013.30(3). The element must follow the guidelines stated in Florida Board of Governors (BOG) Regulations, Chapter 21.

BOG 21.208 states the purpose of the element as follows:

> "This element ensures the conservation, protection and wise use of all natural ecosystems and natural resources on the university campus and in the planning study area".

NARRATIVE

This element outlines the University's goals, objectives, and policies related to conservation of natural habitats and species, prevention of water and air pollution, and the efficient use of energy.

The University is committed to preserving and enhancing its natural areas and the biological diversity they support. The University of Central Florida (UCF) campus lies at the southern end of the Southeastern Coastal Plain, which was designated as a global "biodiversity hotspot" in 2015. Global concern over the loss of biodiversity and habitats due to human activities makes preservation of the campus's remaining natural assets an important goal.

The campus contains sixteen different types of native ecosystems, including important local examples of longleaf pine and sand pine scrub ecosystems, which are considered critically endangered globally. These natural areas contribute importantly to conservation of regional biodiversity, including threatened and endangered species protection. Additionally, our campus natural lands support campus as a living laboratory, and experiential place-based learning.

STRATEGIC PLAN ALIGNMENT

This element aligns with one or more of the four priorities stated in the UCF strategic plan "*UNLEASHING POTENTIAL – Becoming the University for the Future*", specifically:

<u>Student Success and Well-Being</u>
Enrich the student learning experience for the development of career and cultural competencies.

Expand access to high-impact practices such as study abroad, learning communities, internships, experiential learning, and undergraduate research.

Access to hands-on activities in the living laboratories of the UCF Arboretum and campus natural lands enhances our students' experiential learning and undergraduate research opportunities.

5.0 CONSERVATION

SUSTAINABILITY

Sustainability and conservation are intrinsically linked through their shared goal of responsible resource management.

- Conservation practices - such as protecting endangered species or preserving natural habitats - contribute directly to long-term sustainability by maintaining ecological balance and ensuring the well-being of future generations.
- Sustainable practices - such as renewable energy adoption, waste reduction, and ethical consumption - promote conservation efforts by minimizing environmental impact and safeguarding our planet's finite resources.

Goals, Objectives and Policies that align with the Sustainability Tracking, Assessment & Rating System™ (STARS)[1] are shown in **green text**, with the specific *Category and Impact Area* and *Credit* # indicated in parentheses after the Goal, Objective, or Policy.

Specific STARS sections in this element are aligned with these Categories and Impact Areas: **Academics (AC)**, **Engagement (EN)**, and **Operations (OP)**, and these STARS 3.0 credits:

- **AC-4: Applied Learning**
- **EN-1: Outreach and Communications**
- **OP-3: Water Use**
- **OP-4: Ecologically Managed Grounds**
- **OP-5: Energy Use**
- **OP-6: Greenhouse Gas Emissions**
- **OP-12: Waste Generation and Recovery**

RELATED ELEMENTS

See 1.0 FUTURE LAND USE for a table of the acreages of Developed, Developable, and Undevelopable campus lands and the Future Land Use Map.

See 2.0 TRANSPORTATION for policies designed to discourage dependence on personal automobiles and to encourage alternative modes of transportation on campus.

See 4.0 GENERAL INFRASTRUCTURE for more information on Energy Infrastructure and Conservation, and Water Use and Conservation.

[1] STARS (Sustainability Tracking, Assessment, and Rating System) is "a transparent, self-reporting framework for colleges and universities to measure their sustainability performance."

5.0 CONSERVATION

5.2 GOALS, OBJECTIVES and POLICIES (GOP)

A. Conservation of Natural Ecosystems and Resources - GOP

NARRATIVE

The Arboretum and Sustainability Initiatives (ASI) department, a unit of UCF Facilities & Business Operations (FBO), manages the campus natural lands with mechanical vegetation control, prescribed fire (controlled burns), and invasive species removal; and maintains a network of trails, making these areas accessible for nature enjoyment and passive recreation.

The University has received state-wide recognition for its land management program, which focuses on conservation management at the urban-wildland interface. The goals and policies for natural lands conservation presented in this element will enhance the diversity and abundance of native plants and animals living in campus natural lands and will help establish UCF as a national leader in conservation management and environmental stewardship.

Using and conserving water resources appropriately, improving air quality, and preventing or minimizing pollution are key aspects of the University's commitment to conservation and sustainability.

- The University's effort to protect its surface waters is guided by its *National Pollutant Discharge Elimination System (NPDES)* Permit . This 5-year stormwater permit, overseen by UCF's Utilities and Engineering Services (UES)[2] department, is issued by the Florida Department of Environmental Protection (FDEP), and reported for in years two and four.
- Air quality is addressed through transportation initiatives, such as the use of alternative fuels and renewables, and the University's *Air Operation Permit.*[3] This permit is also issued by FDEP, and overseen by UCF's Environmental Heath and Safety department.

GOAL 1: Conserve the region's biodiversity and natural heritage by designating significant campus conservation areas, developing wildlife-friendly landscapes, and minimizing the impact of future development on vulnerable species and habitats.

OBJECTIVE 1.1: Review and designate the status of all environmentally

POLICY 1.1.1: The University shall maintain in a natural state all areas identified as Conservation or Preservation in this CMP.

(OP-4: Ecologically Managed Grounds)

[2] UCF uses an outside consultant, Harris Engineering, to manage this permit.
[3] UCF uses an outside consultant, Grove Engineering, to manage this permit.

sensitive lands on campus, based on state and regionally determined criteria.

- New areas may be designated as conservation in the future, based on documented conservation values, such as the presence of imperiled or vulnerable species or natural communities, or other features of state, regional, or local significance.
- Conservation areas may have minimal structures and improvements necessary to ensure safe access and essential support functions (e.g., signage kiosks, security fencing or barricades, natural water crossings).
- There shall be no construction in conservation areas except pursuant to an amendment to this Plan adopted in accordance with all applicable state and local requirements.
- See Data and Analysis for Improvements to identify and brand conservation and preservation areas as the "UCF Forest"

POLICY 1.1.2: The University shall apply the "Conservation Easement" Land Use Category to natural lands that are set aside in perpetuity pursuant to a recorded conservation easement. This designation allows only low-impact uses such as hiking, bird watching, nature study, or other low-impact uses consistent with the easement requirements.

Other Natural Lands that are not part of a designated Conservation Easement or Jurisdictional Wetland, may be identified and preserved based on the goals, objectives, and policies in this element.

OBJECTIVE 1.2: Conserve, protect, and manage native plant communities and wildlife habitats within a system of interconnected wetlands and upland preserves.

POLICY 1.2.1: The University shall continue to protect and conserve imperiled and vulnerable plant and animal species, including threatened and endangered species, and species of special concern.[4]

POLICY 1.2.2: The University shall coordinate with the Florida Fish and Wildlife Conservation Commission (FWC) to maintain and manage populations of the Gopher Tortoise, *Gopherus polyphemus*, on campus, due to the tortoise's key role as an indicator of upland habitat quality, and its status as a protected species.

Upland preservation areas may serve as gopher tortoise relocation sites until the carrying capacity has been reached for that specific parcel as defined and permitted by the FWC.

[4] See Endangered Species Act of 1973, as amended, Ch. 68A-27, F.A.C. Rules Relating to Endangered or Threatened Species, and federal and state management policies relating to the protection of these species.

5.0 CONSERVATION

POLICY 1.2.3: The University shall coordinate with appropriate state and regional environmental agencies, such as the St. Johns River Water Management District (SJRWMD), Florida Fish and Wildlife Conservation Commission (FWC), and Florida Forest Service (FFS), to manage designated Conservation Areas appropriately.

POLICY 1.2.4: The University shall develop information systems and plans that support conservation management. These shall include, but not be limited to:

- A Geographic Information System (GIS) database that includes digital overlays depicting the location of plant communities, conservation areas, or the locations of threatened and endangered species, and species of special concern, as well as rare or imperiled plant communities (e.g., ranked as G1-G3 or S1-S3 by the Florida Natural Areas Inventory).
- Land management plans that include management and restoration techniques, monitoring and evaluation of species and habitat quality, and detailed methods for the removal and control of invasive, exotic plants in campus natural lands.

(OP-4: Ecologically Managed Grounds)

POLICY 1.2.5: Native plant species should be used in the landscaping of new facilities, to the greatest extent possible.

- UCF shall exclude the use of Category I and II invasive species in landscaping, as listed in the current Florida Invasive Species Council (FISC) List of Invasive Plant Species.
- Efforts should be made to avoid using all other invasive species where applicable.

As defined in UCF's Weed Management Plan, ASI will periodically survey campus natural lands for the presence of Category I and II invasive species; and remove and properly dispose of these exotic plants. Existing landscaped areas will not be cleared of exotic plants.

(OP-4: Ecologically Managed Grounds)

POLICY 1.2.6: The University shall maintain established buffers, termed Riparian Habitat Protection Zones (RHPZ),[5] consisting of uplands that are within 50-feet landward of all campus wetlands.

The RHPZ buffers shall remain in a natural undisturbed state to the greatest extent possible.

[5] See Riparian Wildlife Habitat Standards set forth in Chapter 40C-41.063 of the Florida Administrative Code.

POLICY 1.2.7: The University will use prescribed burns to manage native upland vegetation and habitat in campus natural areas, including those designated as Conservation, and those designated for other Future Land Uses but currently in a natural state.

(OP-4: Ecologically Managed Grounds)

Prescribed burns will be conducted periodically as conditions allow to provide suitable habitat for plant and animal species adapted to these fire-dependent ecosystems (e.g. sandhill, upland pine, pine flatwoods), and to mitigate the potential for catastrophic wildfire.

The University will follow accepted ecological practices or prescribed burns and comply with all applicable regulatory guidelines. ASI will be responsible for conducting prescribed burns and will coordinate with, and notify appropriate internal departments (University administration, Landscape and Natural Resources, Facilities Operations, Environmental Health and Safety, University Police, etc.) and external agencies (Florida Forest Service and Orange County Fire Rescue Department).

Courtesy communications about planned burns will be shared with neighboring residential communities; and traffic signs will be placed near burn sites to notify the campus community and visitors of burn activities.

OBJECTIVE 1.3: Restrict activities that may threaten the survival of imperiled or vulnerable species or habitats.

POLICY 1.3.1: The University shall avoid or minimize biological and hydrological impacts to designated Conservation Areas. Any proposed development adjacent to Conservation Areas shall be designed and implemented to minimize potential impact on the area.

Landscape treatments of any such development shall preserve significant existing vegetation and plan for a gradual transition between developed and undeveloped areas.

POLICY 1.3.2: The University shall avoid or minimize any encroachment into designated Riparian Habitat Protection Zones (RHPZ), which are defined in Policy 1.2.6, above.

If a review of the environmental and economic costs of a proposed development demonstrates that encroaching into the buffer is the only viable option, then the University shall pursue all reasonable efforts to minimize and mitigate any environmental impacts to the area. A permit shall be obtained from the SJRWMD if proposed improvements are within the RHPZ of a wetland conservation easement.

POLICY 1.3.3: During the initial planning phase of any physical changes or impacts to campus natural areas, the University, through the ASI Natural Resources program shall perform an environmental assessment, and census of plant and animal species in the affected area in accordance with:

- "Florida's Endangered and Threatened Species List" current edition (FFWC)[6]
  - Federally-designated: Endangered (FE), Threatened (FT), Threatened because of similarity of appearance [FT(S/A)], or Non-essential experimental population (FXN),
  - State-designated: Threatened (ST), or of Special Concern (SSC).
- "NatureServe Conservation Status"[7]
  - Global (G) Conservation Status Ranks: G1 Critically Imperiled, G2 Imperiled, or G3 Vulnerable
  - National (N) and Subnational (S) Conservation Status Ranks: S1 Critically Imperiled, S2 Imperiled, or S3 Vulnerable
- Or flora and fauna otherwise afforded protection by the host communities and state and federal agencies.

Mitigation plans for any identified species shall be formulated and shall include options for protecting or relocating them, or setting aside other protected areas to mitigate for lost habitat.

OBJECTIVE 1.4: Enhance natural habitats and species in both developed and undeveloped areas of campus.

POLICY 1.4.1: The University shall encourage conservation within its landscaped areas by designing landscapes that provide habitat for birds, pollinators, and other native species.

Landscape design and development will follow the 2016 Campus Landscape Master Plan and Design Standards (or most recent document if updated during the planning period); and will use the principles of the "Sustainable Campus and Landscape Approach" outlined in the plan to develop wildlife-friendly and conservation-oriented landscapes.

POLICY 1.4.2: The University shall support a healthy tree canopy throughout campus by maintaining "Tree Campus: Higher Education" accreditation through the Arbor Day Foundation and fulfilling requirements of that program; and by maintaining its GIS-based, digital "Urban Tree Inventory" and tree care policies.

(OP-4: Ecologically Managed Grounds)

POLICY 1.4.3: The University shall support and enhance the diversity and abundance of pollinator species on campus and shall maintain its designation as a "Bee Campus USA"[8] by fulfilling its annual commitments to the requirements of that program.

OBJECTIVE 1.5: Foster and encourage use of

POLICY 1.5.1: ASI will partner with other entities both within and outside the University to develop courses, internships, and other

[6] Florida Fish and Wildlife Commission https://chnep.wateratlas.usf.edu/upload/documents/Florida-Threatened-Endangered-Species-FWC_2013.pdf
[7] NatureServe https://www.natureserve.org/
[8] Bee Campus USA is a program of the Xerces Society, a non-profit organization that has worked to protect invertebrates and their habitats since 1971. UCF has been an Affiliate since 2018.

campus landscapes and natural areas as an outdoor "living laboratory" for hands-on experiential learning in conservation and land management.	student training opportunities that build upon our programs in conservation and natural resource management. POLICY1.5.2: The University will track the use of the campus as an outdoor living laboratory through site use permits issued by ASI (Exhibit 5.4-3). The University will designate sectors of the campus' natural areas as official laboratory assets, supporting many college research goals which require outdoor study sites. **(AC-4: Applied Learning)**
GOAL 2: Protect regional water and air quality, and human and environmental health, by preventing or minimizing pollution and properly disposing of hazardous wastes.	
OBJECTIVE 2.1: Conserve, appropriately manage, and protect the quantity and quality of regional water sources.	POLICY 2.1.1: The University shall strive to prevent harmful pollutants from entering its Municipal Separate Storm Sewer System (MS4), by following requirements set forth in its "National Pollutant Discharge Elimination System (NPDES) permit" as required by the Florida Department of Environmental Protection (FDEP). Utilities and Engineering Services (UES) shall be responsible for updating the NPDES permit, coordinating NPDES activities, and monitoring campus surface water for compliance with existing surface water quality standards as specified in the University's NPDES permit. POLICY 2.1.2: The University shall use reclaimed water, for landscape irrigation, where applicable. UCF's reclaimed water is sourced from the Iron Bridge Water Pollution Control Facility, operated in Seminole County by the City of Orlando. **(OP-3: Water Use)** POLICY 2.1.3: The University shall continue to monitor and test raw well water, destined for potable use, on a daily and monthly basis per FDEP requirements. POLICY 2.1.4: The University shall continue to implement a comprehensive water conservation program, to include: • Using reclaimed water for the campus irrigation system and chilled water system make-up water • Using automated timers and other irrigation flow-monitoring mechanisms • Planting *Florida-Friendly Landscaping*™ and drought-resistant landscapes for new building construction and landscape renovations, whenever possible • Using low-flush fixtures in new construction and renovations. • Implementing the water conservation plan submitted by the University to the SJRWMD, which is a basis for issuing the University's Consumptive Use Permit (CUP).

POLICY 2.1.5: The University shall not undertake activities on campus that would contaminate groundwater sources or designated recharge areas, unless provisions have been made to prevent such contamination or otherwise provide mitigation for such activities to maintain established water quantity and quality standards.

POLICY 2.1.6: The University shall continue to maintain and update the University Spill Prevention Control and Countermeasures Plan, overseen by EHS. [9]The University shall inspect and maintain all petroleum storage tanks to prevent oil discharges and prepare it to respond safely and effectively to mitigate the impacts of discharge to navigable waterways.

OBJECTIVE 2.2: Maintain or improve existing air quality on campus.

POLICY 2.2.1: The University shall continue to participate in and consider those programs that will maintain or improve existing air quality on campus lands.

POLICY 2.2.2: The University shall minimize emissions of air pollutants by minimizing the storage and use of volatile and hazardous materials in campus buildings, as established by the UCF Department of Environmental Health and Safety.

POLICY 2.2.3: Parking structures shall be designed to facilitate rapid ingress and egress of vehicles to minimize idling time, and to maximize airflow throughout to eliminate pockets of stagnation where pollutants can congregate.

POLICY 2.2.4: The University shall continue to comply with its Air Operation Permit.[10] The University shall monitor and maintain records, provide compliance testing, and maintain stationary combustion equipment and pollution controls to ensure emissions are within permitted parameters. The University shall meet federal and state air quality regulations prior to construction of stationary combustion equipment.

POLICY 2.2.5: To improve air quality on campus, stationary combustion on campus should be reduced, and electric alternatives shall be prioritized over the use of natural gas (or other combustion fuels). A new internal process should be developed to approve or deny the use of new stationary combustion systems.

(OP-5: Greenhouse Gas Emissions)

OBJECTIVE 2.3: To maximize on-campus reclamation of hazardous materials and consumer products.

POLICY 2.3.1: All University buildings shall be designed with facilities to accommodate collection, storage, and disposal of recycled materials.

(OP-12: Waste Generation and Recovery)

POLICY 2.3.2: The University shall provide on-campus facilities for the collection and storage of hazardous materials used in

[9] UCF Environmental Heath and Safety Department https://ehs.ucf.edu/spill-prevention
[10] Air Operating Permit 0950015-017-AO

	University operations as required by federal, state, and local regulations. POLICY 2.3.3: The University shall implement academic programs that promote awareness of environmental benefits of recycling. POLICY 2.3.4: The University shall continue to enforce hazardous materials handling and storage procedures per the recommendations of the Department of Environmental Health and Safety. POLICY 2.3.5: The University shall use only licensed and permitted hazardous waste transportation and disposal companies.
B. Conservation of Energy - GOP	
NARRATIVE	Energy in its many forms impacts nearly every aspect of university life, as it powers the heating and cooling of buildings, water distribution, lighting, computers, and UCF's world-changing research experiments. UCF's enormous appetite for energy warrants serious consideration, given the associated environmental and financial impacts. As energy costs and demands continue to grow, achieving energy sustainability has become increasingly important to the University's mission. Appropriate policies and procedures that govern how we use our environmental resources and facilities will enable UCF to achieve the improvements necessary to establish itself as a national leader in energy research, education, and stewardship. Although this plan focuses on the energy use attributed to buildings and associated systems, the energy and environmental impacts of transportation are equally important. Currently, these two major energy consumers (buildings and vehicles) are largely decoupled, but this will not always be the case. As the use of electric vehicles increases, the interplay between building and vehicle energy will also increase. We owe it to future generations to preserve and protect our finite natural resources, as we are all stewards of this Earth.
GOAL 3: Reduce campus energy use through innovative technologies.	
OBJECTIVE 3.1: Reduce energy use by campus infrastructure, buildings, and systems energy, to meet or exceed peer building benchmark	POLICY 3.1.1: All UCF buildings shall be benchmarked to determine energy performance using the ASHRAE Building Energy Quotient database or other appropriate benchmark databases for prioritization of energy efficiency projects and retro-commissioning activities. **(OP-5: Energy Use)**

5.0 CONSERVATION

Energy Utilization Index (EUI) and Energy Cost Index (ECI) performance metrics.

POLICY 3.1.2: All building lighting systems shall be upgraded to energy-efficient lighting technologies to reduce electrical power and HVAC cooling loads, reduce the maintenance burden of re-lamping efforts, and eliminate the use of mercury-containing bulbs.

(OP-5: Energy Use)

POLICY 3.1.3: All energy-intensive HVAC equipment shall be upgraded at end of life to meet or exceed the current UCF Design, Construction and Renovation Standards, to reduce energy expenditure and improve Indoor Air Quality (IAQ).

(OP-5: Energy Use)

POLICY 3.1.4: All campus site lighting (roadway, parking, sidewalks, signage, etc.) shall be upgraded to energy-efficient lighting technologies to improve site lighting characteristics, thus reducing energy expenditure and improving safety.

(OP-5: Energy Use)

POLICY 3.1.5: All building chilled water connections and associated tertiary pumps shall be modernized to meet both uniform specifications and the UCF Design, Construction and Renovation Standards to improve chilled water usage characteristics, reduce pumping power, and improve the chilled water temperature differential (Delta T).

(OP-5: Energy Use)

POLICY 3.1.6: All E&G funded[11] buildings shall be re-commissioned in adherence to the latest version of ANSI/ASHRAE Standard 202 and ASHRAE Guideline 0.2 within a three-year cycle to maintain building system performance, document performance degradation due to entropy, and prioritize system modernization projects.

(OP-5: Energy Use)

POLICY 3.1.7: All energy efficiency building practices shall be guided by ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1 and the latest green building standard at the time of project conception.

POLICY 3.1.8: The University shall reduce HVAC loads by raising or lowering the temperature in all non-essential, unoccupied spaces after-hours. The University shall also work to implement computer shutdown protocols for all UCF-owned non-server, non-critical computers and peripheral hardware.

(OP-5: Energy Use)

[11] The Education and General (E&G) budget consists of State-appropriated General Revenue, Educational Enhancement (Lottery) funding, and Student Tuition and Matriculation payments. E&G funds are used for general instruction, research, public service, plant operations and maintenance, student services, libraries, administrative support, and other enrollment related and stand-alone operations of the university.

5.0 CONSERVATION

OBJECTIVE 3.2: Transition electrical power sources from public-utility sourced power to onsite renewable energy and other onsite generation technologies.

POLICY 3.2.1: UCF shall strive to reduce greenhouse gas emissions and improve economic stabilization of electrical utility rates.

(OP-5: Energy Use)
(OP-6: Greenhouse Gas Emissions)

POLICY 3.2.2: A Photovoltaic (PV) Prioritization Plan shall be developed and implemented to install PV on select building roofs, parking garages, retention ponds, and elsewhere as approved by the administration.

(OP-5: Energy Use)
(OP-6: Greenhouse Gas Emissions)

POLICY 3.2.3: New construction projects shall be designed and built to be solar-ready, when feasible.

(OP-5: Energy Use)
(OP-6: Greenhouse Gas Emissions)

Solar PV points of connection shall be located at the utility transformers instead of at the buildings, allowing for clear demarcation of PV electrical generation systems from building electrical systems.

OBJECTIVE 3.3: Utilize UCF's infrastructure, buildings, and systems as "living labs" for academic collaboration, research, and hands-on experiential learning.

POLICY 3.3.1: UCF shall continue to develop partnerships between its operations and academic units to enhance the quality of real-world academic applications and foster greater research potential in the areas of utilities, sustainability, and the built environment.

POLICY 3.3.2: Utilities and Engineering Services (UES) shall continue to work with Real Estate & Space Administration and the Registrar's Office to optimize space use and planning, reducing energy use associated with under-utilized and unoccupied spaces.

(OP-5: Energy Use)

Development of an energy conscious space usage policy could result in a significant reduction in campus energy consumption.

POLICY 3.3.3: UCF shall continue to pursue human-led energy conservation policies as outlined in the Collective Impact and Climate Action Plans, such as "Kill-a-watt" competitions and "Green Office" certifications.

(EN-1: Outreach and Communications)

5.0 CONSERVATION

5.3 DATA AND ANALYSIS

A. Conservation of Natural Ecosystems and Resources - D&A

Nature Conservation

Overview

The UCF campus contains significant natural areas, many of which are protected from future development. Areas of interest include the Arboretum, preserved upland areas, wetland conservation easements and other wetlands, Lakes Lee and Claire, and campus stormwater ponds.

Natural areas provide substantial habitat for diverse and abundant plant and wildlife populations and offer attractive campus assets for connection with nature and recreational opportunities. The preservation of both the quantity and quality of these resources is vital to the continued ecological function of these resources as well as the quality and character of the UCF campus.

Nearly half of UCF's Main Campus acreage is natural land, uplands, bodies of water, and wetland habitats. A third of these natural areas are preserved in perpetual Conservation Easements to the St. Johns River Water Management District (SJRWMD). The remainder of UCF's natural areas include jurisdictional wetlands, and wetland buffers, and uplands set aside for long-term voluntary preservation.

Arboretum Park

Arboretum Park is a small urban park included within the acreage of the Campus Core

- The Arboretum, established in 1983 by President Trevor Colbourn, began with approximately 12 acres of a disturbed pond pine community on the east side of the developed part of campus.
- This area is now known as the Arboretum Park. Nearly eight of its 12 acres is wetland W-9A

- Arboretum and Sustainability Building

A new Arboretum and Sustainability Building is included on the Capital Improvement Map. This building will replace the aging modular that lies within the Park. The new facility will be constructed just outside of the Park's borders, freeing up more parkland.

RECOMMENDATION

ASI recommends that the UCF wetland designation be lifted from the W-9A wetland to allow the parkland to be further developed as a Living Laboratory

Arboretum Preserve

Arboretum Preserve lies east of Gemini Blvd. The boundaries of the Arboretum Preserve have not been surveyed for over 25 years. See also Arboretum Park above.

- In 1988, UCF President Altman expanded the Arboretum (k/n/a Arboretum Park) to include a 5 acre Cypress dome, a 2-3 acre oak hammock, and about 12-15 acres of sand pine and wild

	rosemary scrub, connected to the original Arboretum by a cabbage palm community and increasingly rare Florida Longleaf pine flatwoods." This area is now known as the Arboretum Preserve. o In 1990, the Grusenmeyer-Scott Survey showed the Arboretum as 83.507 acres, but only because it included over 35 acres of Wetland 9B as well as the original 12-acre Arboretum Park. W-9B has been protected by a Conservation Easement since 2002, and is no longer considered part of the Arboretum Preserve. o The 1996 Hartman Survey shows the Arboretum as 30.643 ac. o The 2001 DRMP Survey added 7.893ac. "Buffer" east of the Hartman Survey parcel, later redefined as 6.412 ac.
• Land Swap	Part of the Hartman Survey parcel is being repurposed as "RECREATION & OPEN SPACE - Developed" in this CMP. However, a large parcel of land known as the PRESIDENT'S RESERVE is being voluntarily preserved as "RECREATION & OPEN SPACE – Natural Preserve" in this CMP. This parcel was set aside in 1995 for a future president to determine its use. It has been categorized on the Future Land Use Map as Developable for 25 years.
RECOMMENDATION	ASI recommends that the Arboretum Preserve be surveyed during the planning interval.
The "UCF Forest"	ASI recommends that natural areas (examples include: scrubby flatwoods, xeric hammock, basin swamps, marshes, wet prairie, etc.) on the Main Campus be designated as the "UCF Forest."
RECOMMENDATION	These areas could be "branded" to enhance their educational benefits. • Trail Heads could be designed to include entrance features or landmarks at the main entrances to the "UCF Forest." • Signage, at the trailheads, could describe the natural features, ecosystems, flora, fauna, etc. that may be encountered in that part of the "UCF Forest" Decorative natural fences (split rail, bamboo, etc.) could be added along the more public edges of the "UCF Forest" to highlight this campus feature.
• Invasive Species	ASI maintains a *Weed Management Plan* that identifies nuisance plant species in the natural lands. All plants listed in the Florida Invasive Species Council's "2023 FISC List of Invasive Plant Species" are monitored, mapped, and chemically treated. Most of these invasive exotics are stable or decreasing in coverage due to proactive management, with support of funding awards from the Florida Fish and Wildlife Conservation Commission (FWC).
• Monitoring	Vegetation monitoring is completed for environmental permits with the SJRWMD and for internal documentation. Data collected is also used for habitat evaluation and restoration research.

• Gopher Tortoises	Gopher Tortoises and their burrows are surveyed and monitored periodically post prescribed fire by ASI.
• Threatened/ Endangered Plants/ Animals	All listed threatened and endangered plant and animal species that are observed during compliance monitoring and general field observations are documented, mapped, and reported.
Surface Water Quality	
	The University of Central Florida's water features include two (2) natural lakes, Lake Claire and Lake Lee, thirteen (13) man-made stormwater ponds, and several other natural wetland and stream systems. These water bodies are monitored regularly by UES and pond-management contractors. Periodic measurements of pond and lake systems have included dissolved oxygen, temperature, acidity (pH), conductivity, and turbidity. The University currently samples Lake Claire and Lake Lee monthly as part of the "Florida LAKEWATCH" program.
Hazardous Materials and Spill Prevention	
Underground and Above-ground Tanks	The University has several above-ground storage tanks associated with diesel generators, lubricant oil, motor vehicle oils, and used oils. All of these tanks are double-walled and range in size from 25 gallons to 5,200 gallons. The University remediated and closed several old underground storage tanks in the 1990s. The current fuel island was installed in 1995 at the Facilities Management Compound. This underground tank has a capacity of 17,500 gallons and is FDEP-compliant. The University continues to maintain and update its Spill Prevention Control and Countermeasures Plan. The University inspects and maintains all petroleum storage tanks to prevent oil discharges from occurring. The UCF Department of Environmental Health and Safety (EHS), a unit of Compliance, Ethics, and Risk, trains University personnel to respond safely and effectively to mitigate the impacts of discharge to navigable waterways.
Hazardous Materials and Waste	The University uses hazardous materials in its academic and research activities. All such materials are carefully monitored and regulated to assure there is no indication of any prior or current toxic waste problems on the campus. Environmental Health and Safety (EHS) is responsible for ensuring the University's compliance with local, state, and federal environmental laws and regulations. Areas covered include hazardous materials storage, hazardous waste management, environmental assessments, site remediation, the investigation and cleanup of contaminated media on state-owned property, storage tanks, environmental health, and regulatory monitoring to track

	changes to environmental regulations as they relate to environmental compliance. Various campus departments generate hazardous waste, particularly those involved in engineering, science, or health-related research. Hazardous material inventory is maintained by laboratory managers and shop managers in the departments. EHS is responsible for: o The safe and legal disposal of all hazardous chemicals and wastes generated by the University. o Contracting with licensed and permitted contractors for final disposal of waste, after it is collected, profiled, and safely characterized. o Overseeing the inventory training, auditing, and outside agency reporting.
Air Quality	EHS provides monitoring, recordkeeping, and compliance testing in accordance with UCF's Air Operation Permit, issued by Florida Department of Environmental Protection (FDEP)[12]. The University maintains stationary combustion equipment and pollution controls to ensure emissions are within permitted parameters. The University obtains construction permits for new, stationary combustion equipment. According to the 2023 Greenhouse Gas Emissions Report,[13] stationary sources of emissions (generators, boilers, kitchen equipment, etc.) account for 97% of all combustion emissions generated on campus, and 25% of all emissions, including indirect, related to the university.

B. Conservation of Energy - D&A

NARRATIVE	UCF is fully committed to an energy conservation and sustainability program based on universal participation and continual improvement. All UCF buildings and facilities are operated with the health, welfare, and safety of all students, faculty, and staff in mind, and in support of instruction and research. Regardless of their sources of funding, buildings will be operated in the most energy-efficient manner possible. Individual and departmental awareness and accountability are essential to the overall success of this initiative. The current University Policy on Energy and Water Efficiency shall be followed by all members of the University community.
Current Energy Use	University energy data can be viewed on the Open Energy Information System dashboard.

[12] Air Operating Permit 0950015-017-AO

[13] The Greenhouse Gas Emissions Report is one of the credits that UCF reports on for STARS. The inventories are conducted using SIMAP®, which estimates emissions based on the data ASI receives from UES and others related to fuel use, business travel, etc.

5.0 CONSERVATION

UCF has developed a campus-wide system to track and report its energy utilization, which assists operations staff in optimizing building performance throughout the campus building portfolio; enhancing the University's advantage in energy and environment; and developing internal and external partnerships to creatively implement a broad range of expanded demand-side management initiatives.

Energy Efficient Projects

The University is responsible for coordinating numerous energy initiatives related to green buildings and energy efficiency. This includes capital energy improvement projects, renovations, and equipment replacement; and updates to University Policies relating to energy, sustainability, and the built environment.

The University prioritizes energy efficiency projects in Education and General (E&G) buildings based on the total Operations & Maintenance (O&M) costs normalized per square foot of conditioned space. O&M costs are comprised of all utility costs, as well as costs associated with service and repair work orders. While this method tends to prioritize the smaller, energy-intensive laboratory buildings, those buildings often are prime candidates for energy efficiency projects.

Based on this prioritization schedule, the University benchmarks and conducts ASHRAE Level 2 energy audits. In buildings that are not performing optimally, the condition of the energy-using systems contributing to the utility use is assessed. If the systems are still within an acceptable range of life cycle but are underperforming, those buildings are identified as candidates for retro-commissioning (or re-commissioning if they've been commissioned previously). If it is determined that an energy-using system should be upgraded, replaced, or modernized, a design work begins to find initial budget figures and a scope of work for the design and implementation of Facility Improvement Measures (FIMs).

Commissioning Process of New Construction

As described in the ASHRAE Commissioning Standards and Guidelines: Standard 202, the Commissioning (Cx) approach is a quality-focused process to achieve the Owner's Project Requirements, starting at project inception and continuing throughout the life of the facility.

Commissioning is not an additional layer of construction or project management, but rather a strategy to reduce the cost of delivering construction projects and increase value to owners, occupants, and users. It focuses on the integration and interdependency of facility systems, since a performance deficiency in one system can result in less-than-optimal performance by other systems. Upon completion, commissioning is intended to reduce the life-cycle cost of the facility as well as the project capital cost through the warranty period.

All projects at UCF that impact utility use or the indoor environment require Commissioning, according to the University Policy on Energy and Water Efficiency.

5.0 CONSERVATION

Retro-commissioning Process of Existing Building Automation System	The Retro-commissioning (RCx) approach allows for a repeatable, standardized approach to optimizing building system performance. RCx involves verification that the Building Automation System (BAS) is functioning as designed, such as checking if sensors are calibrated and actuators/relays are verified. Devices that are not performing properly are recalibrated, repaired, or replaced, and trend logs and system alarm notifications are updated accordingly. A re-Testing, Adjusting and Balancing (reTAB) is then conducted to restore proper airflow and water flow characteristics to the HVAC and/or laboratory ventilation systems. Once fully functional, the system's sequence of operations is tested and optimized to confirm that the programming is functioning as intended, and opportunities for optimization are recorded.
Lighting Technology Upgrades	Lighting upgrade projects play a large part in energy conservation strategies at UCF. The University will continue to evaluate building and site lighting systems for the possibility of upgrading to more efficient fixtures with uniform lighting levels, color (temperature), and Color Rendering Index (CRI). At the time of this plan's development, LED technology is state-of-the-art and thus is the basis of technology reviewed and approved for upgrade and modernization projects. In even further commitment to environmental stewardship, UCF has committed to complying with the International Dark Sky Association certification for exterior lighting fixtures.
Green Building Standards	Since 2007, UCF has pursued *Leadership in Energy and Environmental Design* (LEED) certification for all new construction, major renovations, and recently for existing buildings adhering to the latest LEED rating system. High-performance buildings play an integral part in supporting UCF's learning environment. Through LEED's high-efficiency standards, UCF LEED buildings are consuming approximately 30% less energy (based on ASHRAE 90.1 2010) and 40% less water than similar non-LEED buildings.
Alternative Fuel Vehicles	Under the Energy Policy Act (EPAct) of 1992, state government fleets with 20 or more light duty motor vehicles are required to acquire Alternative Fuel Vehicles (AFVs) as a portion of their annual vehicle acquisitions. That portion became 75% by 1999. EPAct 1992 originally defined AFVs as "Any dedicated vehicle or dual-fueled vehicle designed to run on at least one alternative fuel." In 2008, EPAct was amended to add qualified fuel cell motor vehicles, advanced lean burn technology motor vehicles, and qualified hybrid motor vehicles

Compliance with AFV acquisition requirements is measured based on AFV acquisition credits, which are earned based on the acquisition of any non-exempt light-, medium-, or heavy-duty AFV or quantity of biodiesel used by the agency during that FY.

UCF's Environmental Health and Safety (EHS) oversees UCF's compliance with EPAct 1992. In replacing existing fleet vehicles or adding to the fleet, UCF has met the requirements of the act:

- UCF's sedans and pickup trucks are primarily flex-fuel or all-electric vehicles.
- UCF is changing its Utility Cart fleet to electric.

Although not UCF-owned, nor earning AFV acquisition credits for UCF; 80% of UCF shuttles run on propane and 20% on biodiesel.

Distributed Generation – Photovoltaic (PV)

Photovoltaic (PV) systems are anticipated to become a greater source of electrical energy on UCF campuses during the 2025-35 planning interval.

See OBJECTIVE 1.2 regarding the transition of electrical power sources from public-utilities to onsite renewable energy generation technologies.

- Rooftop Photovoltaic Systems (rooftop solar panels) are recommended in this CMP for all new UCF buildings.
- Floating Photovoltaic (FPV) systems represent an emerging market for PV systems sited directly on bodies of water.

Possible benefits of FPV include efficiency gains due to lower cell temperatures; reduced balance of system costs associated with land costs and control of vegetation; improved water quality; reduced evaporation rates; and avoidance of land-energy conflicts.

The Florida Solar Energy Center (FSEC) was awarded a contract by the U.S. Department of Energy to assess the performance of FPV systems relative to their land-based counterparts. This will provide UCF with the data necessary to determine the incremental benefits of FPV on campus water bodies, preserving land for conservation or future development.

The rollout of PV installations will be based on energy generation potential, structural engineering reviews, digital grid lab simulation, and available funding.

5.0 CONSERVATION

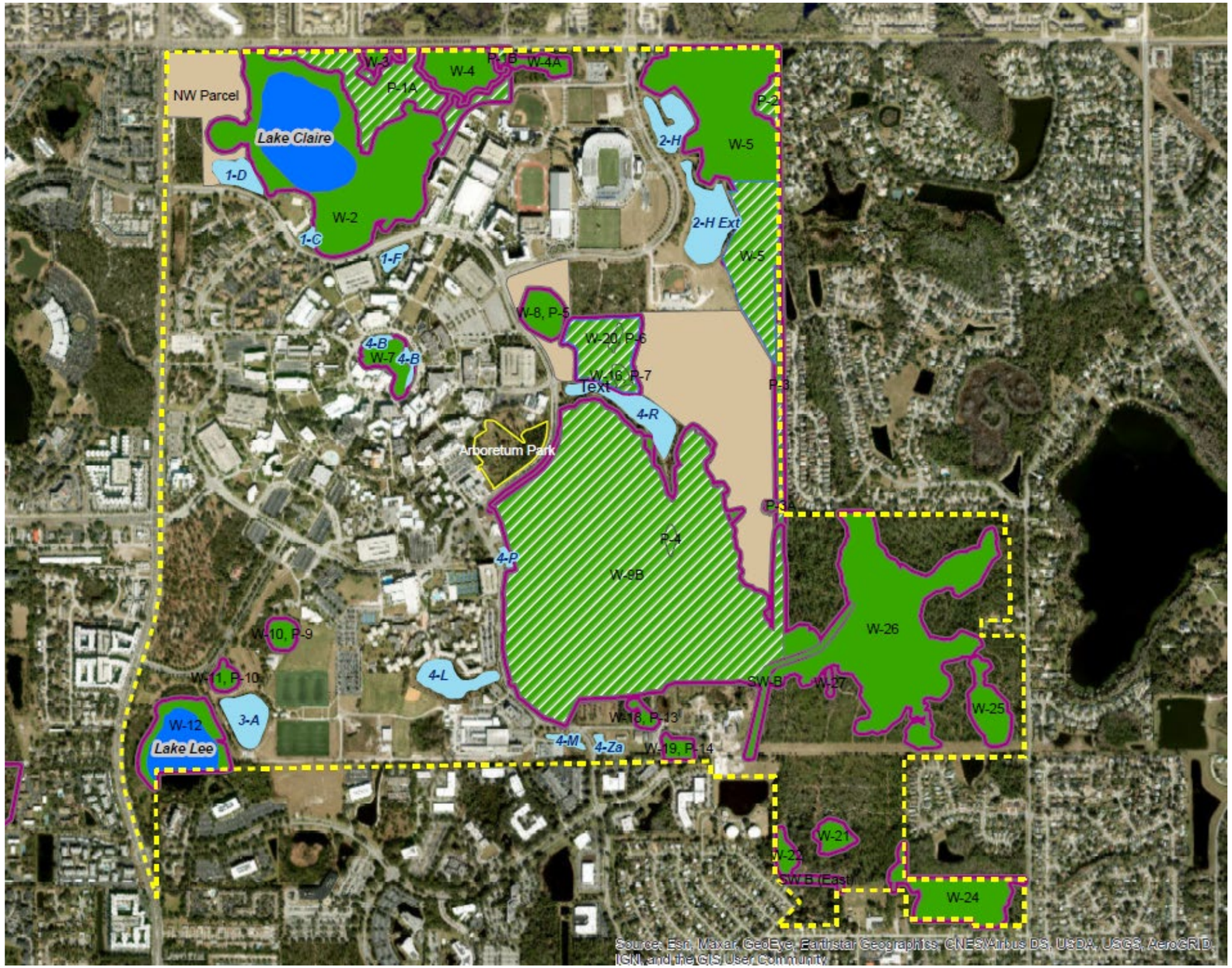
Blank Page

5.0 CONSERVATION

5.4 EXHIBITS

Exhibit 5.4-1 Conservation Lands Map
Exhibit 5.4-2 Map of Threatened and Endangered Plants and Animals
Exhibit 5.4-3 Site Use Permits and Participants Through Time

Exhibit 5.4-1
Conservation Lands Map



Legend

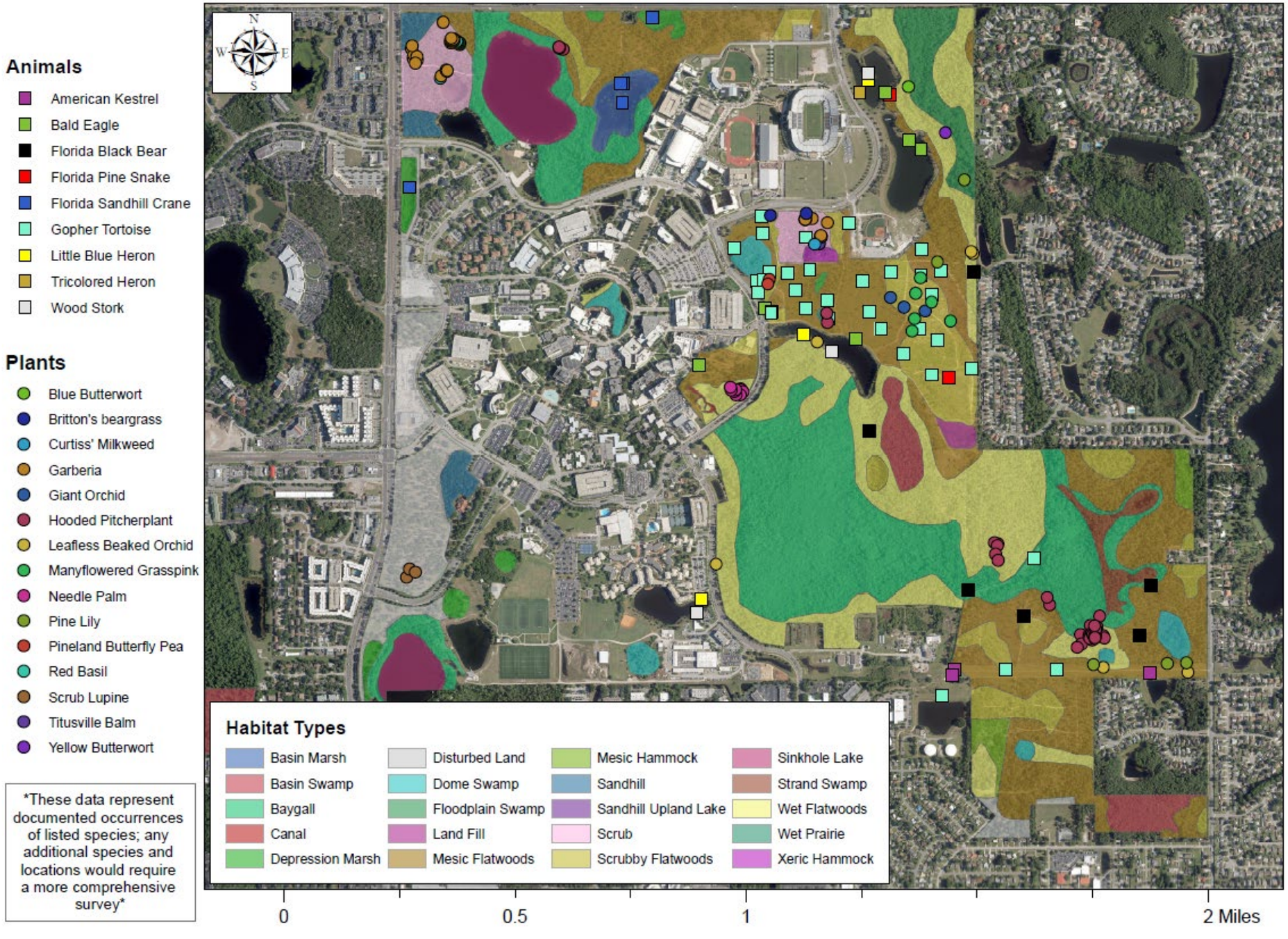
- UCF Boundary
- Arboretum Park
- Natural Lakes
- Stormwater Pond

Preservation Category

- Conservation Easement
- Conservation (Wetland)
- Preserve (upland)
- 50' Protected Buffer

N

Exhibit 5.4-2
Map of Threatened and Endangered Plants and Animals



N

These data represent documented occurrences of listed species; any additional species and locations would require a more comprehensive survey

Exhibit 5.4-3
Site Use Permits and Participants Through Time

Graph detailing approved Site Use Permits and number of cumulative permit participants under the Arboretum and Sustainability Initiatives Site Use Permit program through time.

Bar graph colors represent the cumulative number of approved Site Use Permit participants within a given year broken down by designated use area(s), and are measured on the primary (left-hand side) vertical axis. Line graphs represent changes in the number of approved General Site Use Permits (blue line) and Academic and Research Site Use Permits (black line) through time, and are measured on the secondary (right-hand side) vertical axis.

Site Use Permit applications decreased during the COVID-19 pandemic, but have begun to increase in 2022 and 2023. Please note that these participant data cover only the number of individuals listed on Site Use Permits; areas covered by Site Use Permits are also open 365 days a year, sunrise to sunset, for general public recreational use (e.g., hiking, bird watching, photography) outside of official, permitted use. As such, the number of individuals using these areas in a given year is likely significantly higher than the data presented here.